



COAL AGE



Vol. 8

NEW YORK, JULY 24, 1915

No. 4

APPRECIATION

By MICHAEL BERNARD



You, the men of strong opinions,
Who, from desk and swivel chair,
Issue orders to your minions
With an autocratic air,
Have you never paused a second
As you ruled your mining crew,
And with business judgment reckoned
What a word of praise would do?



When, by some mischance, production
Takes a downward-trending course,
You're the chaps that raise a ruction
And condemn the working force;
But in case their zeal unending
Makes a record-breaking run,
What prevents you from commanding
All the work that they have done?



Do you fear misunderstanding
Of your meager words of praise,
And the men will come demanding
That you give them all a raise?
Don't attempt to puff or flatter,
Shun the bunk and blarney then;
Tell them plainly of the matter
As a man who speaks to men.



Yes, it's very true you're paying
For their heavy toil's return;
Still, they like to hear you saying
That they're worth the wage they earn;
And when words of commendation
Crown their labor's weary close,
Then the cup of their elation
Brimming fills and overflows.

YOU CAN BUY a man's exertions, yet you make him a machine
When you base your whole relation on the crisp and crinkly green;
But the minute that you show him that you've red blood in your veins,
You have changed a bondsman's fetters into friendship's loyal chains.

Alternating-Current Machines for Small Coal Mines

BY E. C. DE WOLFE*

SYNOPSIS—A specific instance of where an old abandoned mine in thin coal was rehabilitated and its operation rendered a commercial proposition by the purchase of power, which is both bought and consumed as alternating current.

Cutting machines driven by alternating current find a field of special adaptability in placing the advantages of machine mining within the reach of small mines for which the expense of a complete power plant seems un-



FIG. 1. THE TIPPLE AT THE "GOPHER HOLE"

warranted. As one example of such application can be cited the American Cannel Coal Co., at Cannelton, Perry County, Ind., on the Ohio River.

Here, by installation of a modern item of mine equipment, there has been rehabilitated one of the oldest mines in the oldest mining district of Indiana. The Geological Survey is authority for the statement that Perry County coal was taken by Robert Fulton aboard the steamer "Orleans" on its first trip down the Ohio River in 1811. First attempts at commercial mining were made in 1837, when the American Cannel Coal Co. was incorporated by act of the Indiana General Assembly "to mine stone coal at Coal Haven," which afterward became Cannelton. A total area of 6456 acres was acquired by various purchases, and in sale of surface for other uses the mineral rights were always retained.

Several mines were opened and coal was hauled in rude cars, on strap rails, over a wood trestle tramway to the river, where a tip deposited the coal upon a floating platform. "Here," says James De la Hunt, Perry County's historian, "a large painted sign called the attention of passing steamboats to the new fuel, lauding its merits as a steam producer and urging its cheapness." The boats all burned wood, and the adoption of coal was slow, yet steady, and the company built up a good trade. During the Civil War river gunboats were fueled with coal from these mines.

Some of the early openings were abandoned as distances and thinning of the seam made working impractical, or

unremunerative with the changes in market conditions in later years. It is at one of these abandoned openings, wherein the coal had thinned to impracticable height for hand mining, that a Goodman alternating-current shortwall machine has been placed in service, giving the mine a new "lease of life" and enabling the company to push ahead into otherwise lost territory, where the coal runs as low as 24 in. in thickness.

To install a complete power plant at this little "gopher hole," as Secretary Shallcross modestly terms the present mine (Fig. 1), would be obviously prohibitive in cost and operating expense. To purchase the only available commercial power—alternating current—and convert it to continuous current for driving a machine of that type would involve installation of converter equipment. This would result in a higher cost and lower efficiency than for static transformers to step down the high-tension transmission line voltage for mine use.

Hence the alternating-current shortwall machine, run by purchased power, received over an economical transmission line and reduced to operating voltage by simple means, involves no attendance charges. Power costs are thus made low and always directly proportional to machine productivity.

CUTTING IS DONE BELOW THE COAL

Underlying the coal is a hard fireclay in which the cutting is done, the difficulties of its hardness being offset by the advantages of gaining the necessary height for working and of saving the entire coal seam for loading out in good-sized pieces. The fireclay is so hard that,



FIG. 2. ALTERNATING-CURRENT MACHINE AT WORK

except in local soft spots, it is known by the men simply as "rock."

Cutting beneath the coal the machine makes a bottom 6 in. below the seam, giving 30 in. of working height where the coal is 24 in. thick. On its special low drop-axle truck the machine enters easily the low rooms, though in some places the ties have to be embedded into the bottom. Roofs on the entries are brushed to give traveling height for the mules.

The drop-front feature of the Goodman truck enables unloading even when the machine may be rubbing the roof. Unloading, running cuts and reloading are all equally easy. Of particular importance, however, is the

tilting shoe with which the machine is fitted and by means of which the runner is able readily to control the cutting, to keep the machine just so far beneath the coal and make it leave a good bottom.

Rooms are worked 30 ft. wide and 225 ft. deep, with 9-ft. pillars through which five 12-ft. breakthroughs are cut, giving about 85 per cent. recovery from the working as a whole. Coal is loaded into 1-ton cars and hauled out by mules over 42-in. gage track laid with 16-lb. rails. Room curves have 15-ft. center radius, on which the operation of the machine is facilitated by the independent cable-reel trailer truck.

Three-phase current is transmitted to the mine at 2200 volts and stepped down to 220 volts for the mine circuits and machine use. The mine leads are heavily insulated and substantially hung along the rib on the entries. The machine is mechanically of standard shortwall construction, with only the electrical parts arranged for use of alternating current.

The American Cannel Coal Co. is only one of many small and moderate producers that have installed alternating-current mining machines of various types to good advantage under their own peculiar conditions.

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German Coal Industry in 1914

In 1889, 25 years ago, the German coal production amounted to 67 million tons. The largest production was reached in 1913 with 191½ million tons, dropping in 1914 to about 161½ million tons, being a decrease of 30 million tons. The reduction affected the states as shown in Table 1.

The production of brown coal in 1914 amounted to 83.9 million tons, being a decrease of 3.2 million tons, or 3.64 per cent., as against 1913, which production still exceeds the output in 1912 by approximately 3 million tons. The production of brown coal in the various states was as shown in Table 2. The decrease in production in 1914, amounting to 33.1 million tons, or 11.9 per cent., compares with the English loss in production of 40 million tons or 15.16 per cent.

In the district of Upper Silesia a brisk demand for all grades is reported. The approach of warmer weather has not, as usual, caused a decrease in the demand, as dealers who as a rule reduced their spring orders by 50 to 60 per cent. endeavor to close summer contracts in undiminished quantities. The coal combine, however, is not inclined to comply with these demands, one reason being

TABLE 1. COMPARATIVE GERMAN COAL PRODUCTION IN 1914 AND 1913 IN 1000 METRIC TONS

State	1914	1913	Loss (%)
Prussia.....	153,006	181,413	-15.66
Saxony.....	4,836	5,471	-11.61
Bavaria.....	660	811	-18.62
Alsace-Lorraine.....	2,857	3,796	-24.74
Other districts.....	176	20	+880
Total.....	161,535	191,511	-15.65

TABLE 2. COMPARATIVE GERMAN PRODUCTION OF BROWN COAL IN 1914 AND 1913 IN 1000 METRIC TONS

State	1914	1913	Loss (%)
Prussia.....	67,424	70,256	-4.03
Saxony.....	6,298	6,312	-0.28
Bavaria.....	1,601	1,895	-15.52
Hesse.....	402	429	-6.30
Brunswick.....	2,235	1,824	+22.53
Saxony-Altenburg.....	4,797	4,910	-2.30
Anhalt.....	1,180	1,474	-19.95
Reuss.....	10	12	-16.67
Total.....	83,947	87,116	-3.64

to prevent speculation and the other to consider in the first place manufacturing industries and gas works of

central and northeast Germany, which now depend exclusively upon the Upper Silesian production. Regular customers, however, are served as before.

Deliveries on contracts are made promptly, and in spite of lack of labor the output approaches 68 per cent. of the normal production, thus complying with the domestic demand, besides furnishing 100,000 tons monthly to Austria.

The export from the Upper Silesian coal district amounts now to 6 per cent. normal production, as compared with 38 per cent. in normal times. Provision has been made for a considerable reserve in coal in order to safeguard the necessary requirement for the industries, in case the political situation should cause a further reduction in the output.

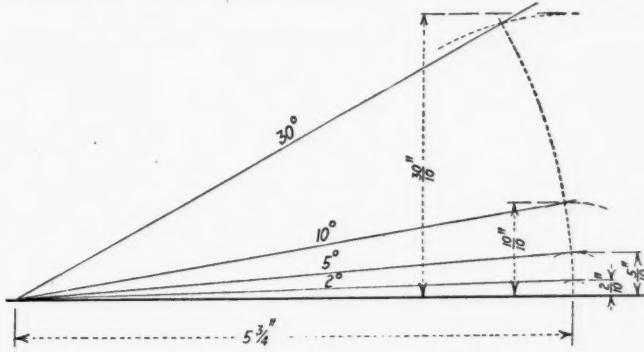
Inquiries for delivery are reported from Holland, but which under the circumstances cannot be considered, as all surplus quantities are being reserved for the Austrian market.

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Laying Out Small Angles

Francis W. Shaw in the *American Machinist* describes a simple but accurate method of laying out small angles in the absence of a good protractor or drafting machine. As much accuracy is obtainable in this method of plotting angles as is secured when an ordinary protractor is used. Theoretically the error in laying out an angle of 1 deg. by this method is but 4 sec. With an angle of 10 deg. it is less than 1 min., and even a 30-deg. angle can be determined in this way with an error of only 13 min.

From the base line draw an arc of $5\frac{3}{8}$ -in. radius and lay out the desired angle along this arc, setting the com-



MANNER OF LAYING OFF ANGLES WITHOUT A PROTRACTOR

passes or dividers to $\frac{1}{16}$ in. for every degree. Join the center of the large arc with the points determined on its perimeter.

For angles approaching 30 deg., lay out an angle of 30 deg. with the triangle and add or deduct the small angle of difference. For angles near 15 deg., bisect an angle of 30 deg., adding or deducting the difference in angle.

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Chinese Mining Superstitions—Although the Liao Yune district in Mongolia is hilly, there are no mountains where mining operations may be carried on. This is due to the fact that the mountains which may possibly contain minerals are considered sacred by the Mongols, and therefore out of reach of mineralogists. Should any construction materials, such as sand or stone, be required for repairing roads, etc., they must be obtained from districts well removed from these mountains.

Pea Coal--An Outlaw Size

For several months past the wholesale prices in the anthracite market have been badly unsettled. There has been a wide divergence between the prices as shown on the circulars issued and the actual selling prices, particularly as regards pea coal. The low market value of this grade has been due to nothing more than a natural adjustment to an inevitable condition. As is well known, pea and all the smaller sizes are byproducts pure and simple; in other words, these sizes are not made by design, but happen in the production of the so-called prepared or domestic grades. The production of pea ranges from 10 to 40 per cent. of the entire output, the variation depending on the hardness of the seam from which the coal comes and the percentage of larger sizes for which the breaker rolls are adjusted. A fair average would be 22 per cent.

In the beginning of the anthracite industry pea and the smaller sizes were regarded as waste products. Finally a market was developed for them as steam fuel, but in addition pea began to find quite a place for itself in the domestic market, because of its low price as compared to the next nearest domestic coal; the operators, however, tried to discourage its use as a family coal, insisting that it was only a steam fuel.

With the natural advance in price of all commodities during the past 10 years, pea coal experienced a raise proportionate to the other sizes, which made its price as a steam coal, in competition with bituminous, practically prohibitive. As a result there is now less than 1 per cent. of pea coal being used for steam purposes, and while the smaller sizes still maintain their position as steam coals, almost the entire tonnage of pea is left to be absorbed as best it can. The only market left for this grade is naturally the domestic or family trade, and it has now become eminently a family size and must be so considered. It will probably continue a family coal exclusively unless the operators are willing to make an attractive offer to steam consumers. This would certainly tend to stabilize the market on all sizes and would help to prevent the unsettling conditions due to price cutting on this grade.

3

How to Repair Steel Tapes

Many engineers and surveyors repair their own steel tapes, the repair outfit consisting of a combined punch and rivet set and copper rivets or eyelets. Few know how to repair a broken tape properly, even when furnished with all the necessary facilities, says *Engineering News*.

The point which needs the most emphasis is that no matter how it is broken some of the original tape must be cut away and a new piece spliced in. This applies both to graduated ribbon tapes and to most of those made of heavy flat wire. Any mend which stiffens the tape at the splice weakens it and makes it more likely to break near there a second time, especially in the case of thin ribbon tapes. The only exception is in repairing heavy wire tapes, $\frac{1}{8}$ in. wide or less, which are usually so stiff that they can be mended with a soldered sleeve.

In Fig. 1, tapes Nos. 1, 2 and 3 illustrate defective splices. No. 1 is made by lapping the tape by 0.12 ft. and securing the lap with six eyelets. A little consideration would have shown that two eyelets and a 0.02-ft. lap would have done just as well.

No. 2 is another lap joint a little over 0.1 ft. long. In No. 3 the whole of the old tape has been retained and the

repair made by riveting a piece 0.15 ft. long on the back. Solid rivets have been used, though eyelets would have been preferable. Nos. 2 and 3 also illustrate defective methods of fastening on the end rings—the laps for that purpose are too long. However, the handle in No. 2 illustration would be correctly fastened if the laps were shorter, for two eyelets have been used to secure the lap, and that is the correct number.

Nos. 4 and 5 show conscientious and ingenious attempts to assure flexibility, but by means not to be recommended.

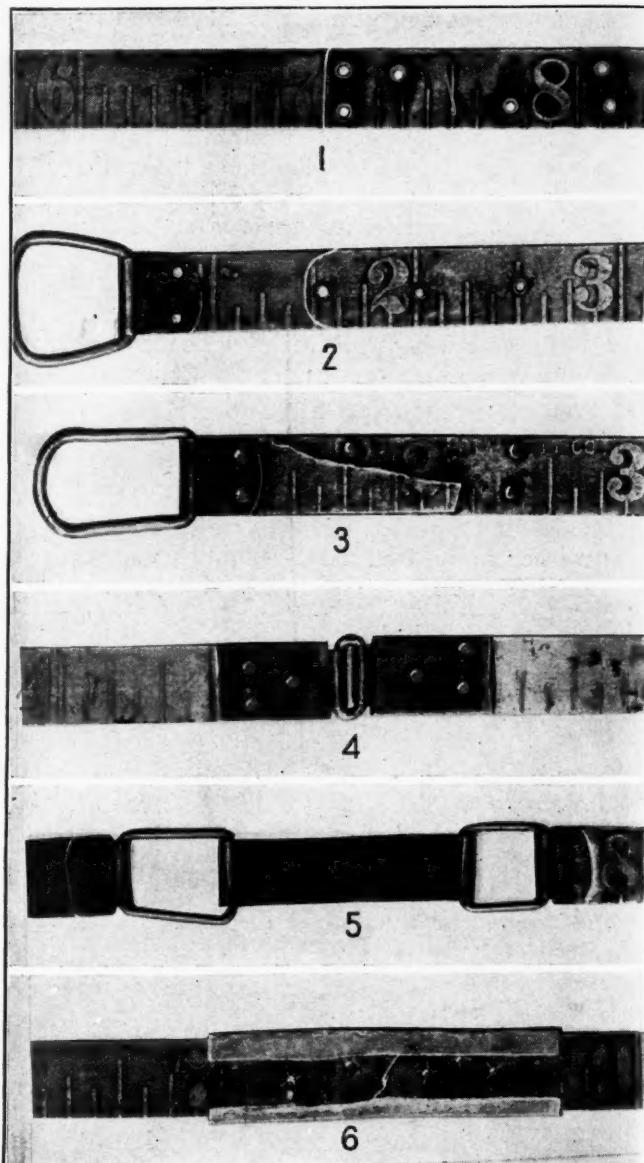


FIG. 1. "HORRIBLE EXAMPLES" OF TAPE REPAIRS

No. 6 is a crude but effective repair, no doubt made in camp. The sleeve was probably cut from a tin can, and it is likely that a nail was used for a punch, the motive power being furnished by blows of an ax. There are no rivets, and the sleeve holds by depressions punched partly through the tape.

In Fig. 2 is illustrated the proper way to make tape repairs. First punch two holes in each of the broken ends 1 in. or more back from the break. Take a piece of tape about 2 in. longer than the completed splice is to be, lay one of the broken ends on the splice, tying it tightly to insure proper alignment, and punch holes in the splice through the holes already punched in the tape, placing and setting a rivet as soon as a hole is punched. Solid

rivets are used for flat-wire or band tapes, and when the tape is $\frac{1}{4}$ in. or less wide, the rivets are placed in tandem, as shown in No. 1, Fig. 2. After the splice has been riveted to one end of the broken tape, lay the other broken end on it and butting the two ends of the break together, tie it in place and rivet as before. When all rivets are driven, notch the ends of the tape close to the

Indiana Mines Yield More Than 16,000,000 Tons of Coal

In 1914 the mines of Indiana yielded 16,641,132 tons of coal, having a value of \$18,290,928, according to a statement by C. E. Lesher, of the Geological Survey. This shows a decrease from the 1913 figures of 524,539

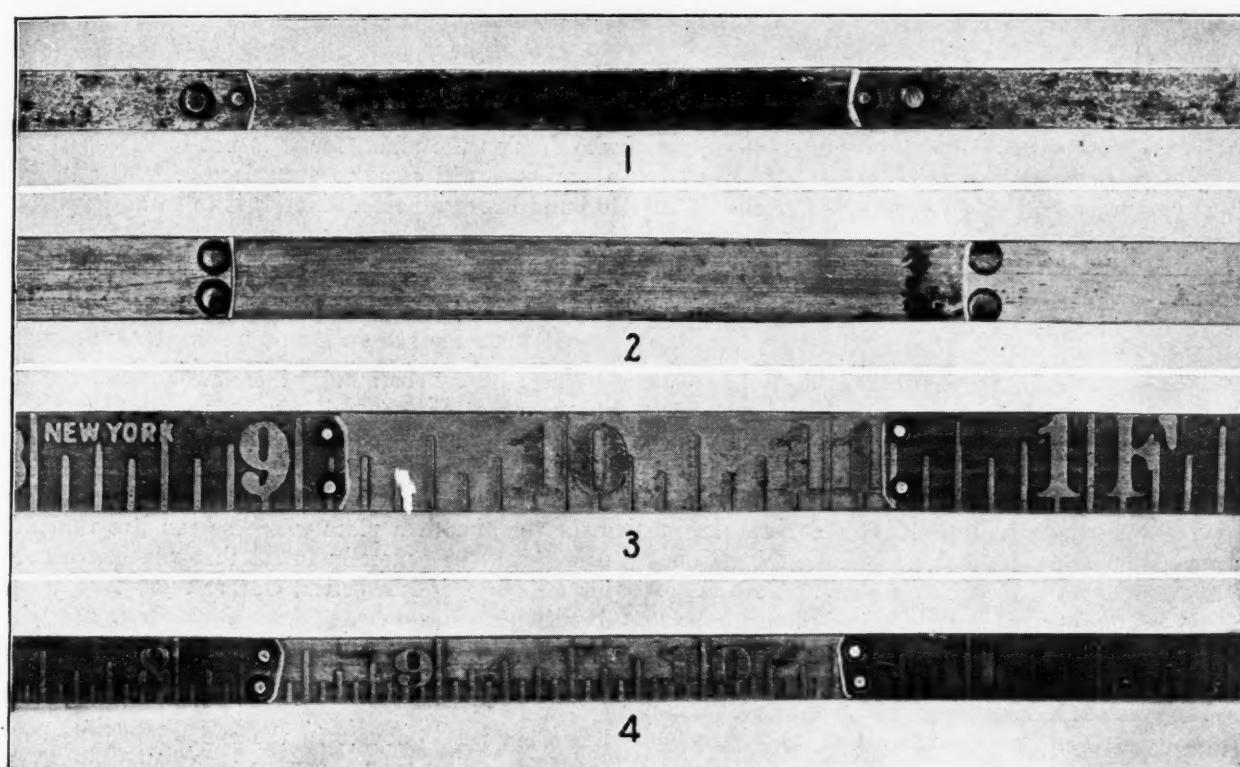


FIG. 2. EXAMPLES OF TAPES REPAIRED SO AS TO PRESERVE THE MAXIMUM FLEXIBILITY

rivets with an edged file and break the tape on the file marks. In the same manner notch and break off the ends of the splice close to the rivets. The result is a lap of not over 0.03 ft. for a tandem splice and a little over 0.01 ft. (or $\frac{1}{8}$ in.) for rivets side by side, which means a tape practically as flexible as if it were new. For thin ribbon tapes eyelets should always be used instead of solid rivets, as shown in Nos. 3 and 4, Fig. 2.

To replace a broken ring or repair a tape broken at the ring, take a piece of similar tape showing any foot

tons, or 3 per cent. in quantity, and \$710,953, or 3.7 per cent. in value.

Out of 19 coal-producing counties in Indiana 6 showed an increase in 1914, all the increases being small except that in Vigo County, which in 1914 had an output greater than in 1913 by more than 530,000 tons. On the other hand, the neighboring counties of Greene, Clay, Knox and Parke each showed a decrease of over 100,000 tons. The average price per ton for the state was \$1.10.

There was no decrease in the proportion of the product shot off the solid, the figures being 5,175,229 tons in 1913 against 4,968,065 tons in 1914, approximately 30 per cent. in both years. The quantity of hand-mined coal decreased from 11 per cent. to 10.6 per cent. in 1914, and the number of mining machines in use increased from 732 in 1913 to 751 in 1914.

The Bureau of Mines reported 44 fatal accidents in the mines of Indiana during 1914, a decrease of 22 from those reported in 1913. This brought the death rate per thousand from 2.97 in 1913 to 1.97 for 1914.

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Higher Coal Prices in England

The West Yorkshire Coal Owners' Association on June 1 advanced household fuel 81 cents per ton and industrial fuel \$1.46 per ton, says *Commerce Reports*. The prices are now \$2.67 for pea-slack, \$3.40 for rough slack and \$3.89 for nut at the pit. The *Yorkshire Post* states that the enhanced prices make the industrial situation a difficult one and that still another advance is hinted at.

mark. Lay the ring with its clip or sleeve in place on this splice-tape, and hold it there by slipping a narrow piece of tape (or wire) under the splice-tape and over the ring (see Fig. 3). Punch one hole through the ring clip and tape, separate, and cut the tape close to the hole; insert the clip, and rivet, using a long eyelet. Then punch the second hole and rivet as before. Notch the clip with a file close to the eyelets and break it off on both sides of the tape. Rivet the new section to the broken end, not less than $2\frac{1}{2}$ in., or 0.2 ft., from the end, being careful to lay the new piece on top of the old tape.

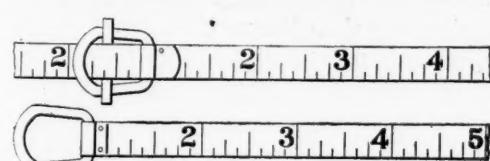


FIG. 3. HOW TO PUT THE RING END ON A TAPE

Why Are Strikes at Coal Mines of Such Frequent Occurrence?--II*

BY HUGH ARCHBALD†

SYNOPSIS—The policy of coal operators has too often been to build poor houses and make undue profits from them. This has led the miner to believe that he is the victim of every kind of injustice. The miner needs the union. If the union is not what it should be, the faults are not inherent in the organization, but are merely incidental.

One of the causes for the frequency of strikes is the company house, on which the miner feels undue profits are made. It hardly needs argument to prove that there is a desire in every man to live decently. The "hunkies" and foreigners who come to this country do not have as high a plane of living as those who have been here a long time. But the foreigner soon acquires the desire to live on a higher plane and will readily admit this as a fact.

I have heard one Polander who had been here only 15 years explaining that the reason why a certain compatriot's scale of living was low was because the man had been in America only a couple of years. This fact is recognized by the management of many companies, and good work is being done in improving mining towns. It is a movement that comes second to the safety-first propaganda, but it is not as general or as thorough as it might be. In many places much talking is done, but little actual work is accomplished, only enough to make a superficial compliance with a fashionable fad.

It should be a distinctly recognized factor that mining differs from manufacturing in that the whole life of the community is dependent upon the management of the mine. In manufacturing there is not that absolute dependence.

In the first place, mining is the winning of raw material and must be carried on at the point where the material is found. On the other hand, a factory can be located at any central point where raw material can be brought to it conveniently and where the finished product can be readily shipped away. The location of such a plant does not need to be moved as the sources of its supplies change, and there is no limit to the length of its life, for the products it uses and produces vary with necessity.

OPERATORS MUST BUILD HOUSES

The life of a mine is limited, and when it is ended no other mine in the same neighborhood will take its place. As a result a mine is a temporary installation; nothing is built in coördination with its activity, and the mine worker is largely isolated from workers in all other lines. Frequently a mine is situated at the end of a branch railroad away from the main currents of travel and thought. This would tend to cause the community to retrograde, but the tendency is offset by the short length of life of the mining town and the frequent coming and going of its inhabitants.

On account of this isolation it is necessary that towns be built where mines are opened. Factories, on the other

*The previous article is contained in the issue of July 10, 1915, pp. 48 and 49.

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hand, are erected where communities have been already established, and in such places there are persons outside the particular industry who make it a business to build and rent houses at the mine.

The houses must be erected in the beginning by those who develop the plant, for it is not to be expected that a workman will come to any place with enough capital to build his own house. Nor is it to be anticipated that he will invest in immovable property when the returns in that investment are dependent upon his retaining work in a certain mine.

MINERS PREFER TO BUILD THEIR OWN HOMES

Where in any community there are a number of mines run by different companies, so that a workman can feel reasonably sure of getting work in another place should he lose it in any one of them, then it will be found that he will build his own home, putting forth an effort to make for himself a place where he can live contentedly. And it will be generally found that where a man owns his residence, it is a better, cleaner place than when his dwelling is a house rented from a company. The change in some parts of the anthracite region with the disappearance of the rows of company houses is an instance of this.

The necessity which has led to the building of towns has often led to abuses in the end. For it is too easy to discover that money can be made on what has been invested in the houses.

It is true that no capital should be invested without a return being sought. But as the number of mines increases in any neighborhood, the opportunity for a workman to live in a house not owned by the company will increase. And thus when a man applies for work, the first question asked of him is, "You take house?" If he does not "take house" then he does not get work. And a superintendent who does not force the men to live in the company houses, no matter how badly out of repair they are, is likely to lose his job.

And as there is compulsion to make a man live in a company house the care of such houses is often neglected—more grievously than the man in charge of the houses often realizes himself. This is quite in contrast to the principle of merchandising good goods at a reasonable rate, which is the rule of a modern store. The temptation exists under these conditions to try to obtain a large return on the money invested in houses.

And the reaction from this manner of making money crops out in the mine. It spreads through all the intercourse between those who are trying to make money on an investment and those who are seeking to make money by their labor. When it becomes patent to the workmen that a good profit is being made at their expense in the renting of houses or any other line, they naturally resent it, and so in their work they "loaf" as much as they can in order to try to make up in one direction what they lose in another.

"Do others, for they do you," may be a first principle of business and one that may work out successfully for a merchant who deals only once with any one person, but

as a principle for application in a mining community, where the intercourse between a company and its men is continuous and not only involves the man himself, but his family as well, it is false and unreliable. It is a principle from which only trouble can be expected and one that will cost money in the end.

Some months ago a superintendent was telling what he was doing and boasting that he had all his houses rented. "You know," he said, "even my sand house is rented to two men." These employees may not have been able to express the feeling that the only interest the boss had in them was to make money out of them, and just as much money as was possible, but they felt it nevertheless. This thought affected not only those who lived in the sand house, but all the others—even those who may have been living in good houses. In return when any chance came to attack the company and turn the tables, it was entered into with joy.

Many people are discouraged because there is not an immediate response to any attempt they may make to do betterment work. The cleanliness of a New England village is a matter of long growth, and with the inhabitants of a mining village there are long years of neglect behind, in which prejudices have become fixed which can be eradicated only by living them down. A quick response is not to be expected and results cannot be hurried. They must grow.

SHOULD NOT BE DISCOURAGED BY SLOW RESULTS

It must be remembered that there is no encouragement for the men to respond. For the length of habitation of any man and his family is dependent upon the whim of a monarch—the boss. A man may be able to please the boss for years and hold his job, and yet again a mistake may arise the next week and he would lose it.

The house he lives in must then be vacated; so why make any improvements? They are fastened to the soil and cannot be moved when he is forced to go away. If he moves, his labor is wasted and will go to the next tenant, and in the next town to which he goes he will probably have to rent a dirty house and begin improvement work all over again.

Those who are trying to make their own mining communities better places for living and who feel discouraged may renew their flagging spirits with the thought that their numbers are continually increasing. But they will have to stand alone until the whole mass of the mining fraternity has for an extended time earnestly assumed its responsibilities, for such responsibilities it certainly does owe to the communities which are dependent upon the coal industry. By that time the distrust and irresponsiveness of the mine worker will disappear. Meanwhile, any individual operator if he would counterbalance the indifference of the rest, must work hard, for one cannot pass through a plague and escape infection from without except by taking unusual precautions.

NEED FOR MINE-WORKERS' UNION

Another cause for strikes is the desire for a recognition of the union. The desire of the men to confederate should be viewed in a different light from that which is now customary. There is a real need for some such organization as the United Mine Workers of America. It is not the first time in the history of our civilization that unions have existed. The Greeks and Romans were troubled with them and had to surrender to their importunities.

The work in all the countries of Europe throughout medieval history was performed by unionized workmen, and English labor has been helped by them.

They have not always been known as unions. The organizations had other names or no names at all. At least the names of many of these bodies have not come down to us. The causes for which they struggled and the manner in which they were constituted have changed from age to age, but the underlying purpose is the struggle of the mass of the people for a better life. But as the desired ends were attained, the organizations have passed away only to become a memory. It will be the same with "the union."

It is interesting to note that in London in the year 1517—almost four hundred years ago—occurred "Evil May Day," which was so called because a strike riot occurred on that day for which 12 rioters (apprentices) were hanged and 400 more pardoned with the rope around their necks. But such doings did not remove the causes of discontent nor end the turmoil. An account written at the time gives the same causes for the riot as we find assigned for riots today. It says:

Before May Day, poor handicraft people which were wont to keep shops and servants and had labour and living by making pins, points, girdles, gloves, and all such other things . . . had thereof sale and profit daily, until thirty years ago. . . . Many rich men is risen upon the destruction of the poor people, which poor people perceived themselves as having no living . . . not able to keep no houses . . . but in alleys sitting in a poor chamber working all the week to sell their ware . . . which would not give them so much winning for their wares to find them meat and drink.

And it is interesting, moreover, to know that among the other causes for the riot was a protest against foreign labor which was lowering the scale of living. Those who are working in mines are so close to the daily struggle that it is hard for them to get a perspective view of the situation. So it is excusable but nevertheless wrong for mine managers to condemn the union without qualification. It is true, the men blindly follow ignorant and self-seeking leaders and that those leaders become arrogant when they feel the strength of the union behind them. But the trouble is with individual men and not with the organization as a whole. The shoe is on the other foot when the unions condemn corporations. Corporations and unions are not animate things and are only as good as their thinking managers.

The basic desire underlying the formation of the United Mine Workers of America and the thing that holds it together is the desire of the individuals for a higher scale of living than they now possess and a chance to earn that living. When agreements between managements and men are in process of formulation this desire is given expression, in the form of one demand or another. But it is by playing upon the basic desire and by dressing it in different forms that the leaders hold the men together and can lead them to strike for the granting of their demands. But were these intense desires not there, the men could not be led into strikes.

UNION A NUISANCE AND THE GRIEVANCE COMMITTEE AN INSULT

The man at a mine generally looks upon the union as a nuisance and the grievance committee as an insult. The man in the nonunion districts can give orders without any explanation of why they are issued, nor does he have to worry if a man is idle for a week or so after his place is finished before he is given another. He does not

have to trouble about the equal turn of cars. He can make the men live in the company houses and trade at the company store, no matter what treatment they receive.

The only recourse the men have is to go to some other place for work. It is a consummation of the idea that the boss is boss and what he says must go and go in a hurry. That is the principle of an absolute monarchy. But as monarchies in the state have gone down before democracies, so too it is now generally admitted that there is a growing democracy in work, though its realization is a long way off. Yet the man who will acknowledge this and give explanations of why he issues orders to a group of men is more likely to get along in peace with that group than he who tries to rule autocratically.

The grievance committee, instead of being considered an insult and a body of loafers about which to complain loudly, should rather be welcomed by any boss who is earnestly trying to treat his men with justice. He should regard it as a needful check upon himself and a guarantee that he will not fail to do his duty to all his employees. It is only too easy, as I know from experience, to forget this obligation and to neglect a man, leaving him without a place or opportunity to work.

The grievance committees are often composed of men with whom it is hard to argue. They may be and often are men who seek a place on the committee merely to further their own purposes. They may be loud-mouthed demagogues. That is not a basic fault of the union, and an attack should not be made on it in general, but upon the individual, efforts being made meanwhile to get honest men on the committees.

OPERATOR IS UNHEARD BECAUSE HE SAYS NOTHING

When an agitation is being made in one direction it can only be met by one in the opposite direction. Too little of this is done. A mason's helper drifted into my office one morning on an idle day, and I talked with him. He told me about himself—that he was a socialist and a former member of the Industrial Workers of the World. I found he knew the works of Marx and Mills and others. In fact he was remarkably well-read. Telling me about meetings among the mass of workmen and how the I. W. W. sent out professional speakers, he said: "I go and argue against them. For what can these poor people do? They are ignorant and cannot prove that what is said is wrong. I go to the meetings and debate with them, and they listen to me and believe me." And he ended, speaking of the people in general, "They will listen if you speak to them."

That is it. No manager meets his workmen on a common plane. The commonly accepted philosophy of life says that one must hold one's dignity and be a boss rather than a leader of the men. We think that the men won't recognize one who is attempting to be a leader and will abuse his efforts. But it does not follow that when one relinquishes the position of autocratic boss, one softens one's muscles. The man who would lead needs more strength of character than a mere tyrant. A weak man will have more success as an autocrat than as a leader.

In the previous article I have spoken about the inequality of the miners' pay and the way it is reduced by an inadequate supply of mine cars. In this article I have discussed the house question and the attitude of the operators toward the union. These three elements in the relation between operators and men are bound up with

one another and cannot be considered separately. If the questions that each raises are regarded with the same old philosophy of life—the philosophy of a chattering monkey swiping coconuts from his companions—no solution can be obtained. This is the philosophy that "business is business and the devil take the hindmost." It is the expression of the idea that no one can advance except at the expense of his fellowman.

But there are any number of good old proverbs that proclaim a different philosophy. E. H. Gary, of the United States Steel Corporation, announces a more reasonable doctrine in a recent number of *Harper's Magazine*, and it is to be hoped that his example will be followed throughout industry. Countries have been struggling for hundreds of years under the old negative philosophy which argues that capital should forbid labor a voice in its control, and with all their boasted progress they have to admit that the same demonstrations are repeated over and over again. Under a new active philosophy of labor betterment, better conditions are to be expected.

■

Virginia Has Good Coal Year

The production of coal in Virginia in 1914 was 7,959,535 short tons, valued at \$8,032,448. This was 868,533 tons less than in 1913, with a decline in value of \$920,205, yet the output was greater than in any year previous to 1913, according to the figures compiled by C. E. Lesher, in coöperation with the Virginia Geological Survey, and just made public by the U. S. Geological Survey. The decrease in quantity was 9.8 per cent. and in value 10.3 per cent. and is attributed to the smaller demand from the iron business for coke, and to the smaller quantity needed to meet the requirements of the railroads and cotton mills.

For several years Virginia has stood relatively high in the quantity of coal produced by each man employed, and 1914 was no exception to the rule. The number of men employed in the coal mines of the state increased from 9162 in 1913 to 9183 in 1914, and the average working time decreased from 280 days to 235. The average production per man in 1913 was 964 tons and in 1914 was 868 tons. The average daily production per man was greater in 1914, being 3.59 tons against 3.44 tons in 1913.

■

Coal Production in Oregon

In 1914 Oregon produced 51,558 tons of coal, valued at \$143,556, an increase of 5495 tons over the output of 1913, according to the Geological Survey and the Oregon Bureau of Mines and Geology with which the Survey co-öperates. The only productive coal field in Oregon is in the southwestern part of the state, in Coos County, and known as the Coos Bay field. Other coal fields have been prospected in different parts of the state, but none has been developed to the point of production.

Coal production has never been one of the important industries of Oregon, and during the last few years has been of less importance than formerly because of the large increase in the production of petroleum in California and in its use as fuel. In only four years has the production exceeded 100,000 tons, and in each of the three years preceding 1914 it was below 50,000 tons.

Automatic Incline Devices

BY RALPH W. MAYER*

SYNOPSIS—Some of the safety devices employed on a 4000-ft. slope of the Roslyn-Cascade Co.'s mine No. 1. These safety stops, derail switches, etc., are for the most part entirely automatic in action.

The Roslyn-Cascade Co., of which William McKay is general manager, lowers the coal from its mine No. 1 down an incline about 4000 ft. long, which crosses several gulches on high trestles and runs through several short tunnels to the tipple. As a runaway trip on this incline would do costly damage and be dangerous to human life, all possible safeguards have been adopted. In most cases these have been made to work automatically.

The loaded cars going down pull up the empties. The cable, at the top of the incline, passes several times around either half of a double drum placed horizontally. Strong brakes on these drums, both operated by one lever, regulate the speed at which the cars travel.

The shaft of a small engine, which is also used to hoist cars from the top of the incline into the mine, has a sliding miter-gear wheel, which can be thrown into mesh with a gear wheel, on the circumference of one of the drums, if it becomes necessary to use power for hoisting material up the incline.

A three-rail double track is used on the upper half of the incline, from the knuckle to the turnout where the trips pass each other.

STOP-BLOCKS ARE PLACED AT THE KNUCKLE

Automatic stop-blocks are placed at the knuckle. These are two in number—one in the middle of each track. Each stop-block is made from two timbers framed together side by side, one timber next each rail, and of the necessary strength to stop a runaway trip or car. These timbers move up and down vertically between the rails. Their ends are iron shod.

One heavy timber placed across and underneath the track on the upper side of these stop-blocks at their bottom end and another on their lower side directly underneath the rails prevents a runaway trip from moving them. The stop-blocks slide up and down against and between these timbers.

Several timbers placed lengthwise between the rails, and fastened with drift bolts to the ties, directly below the stop-blocks, materially strengthen them.

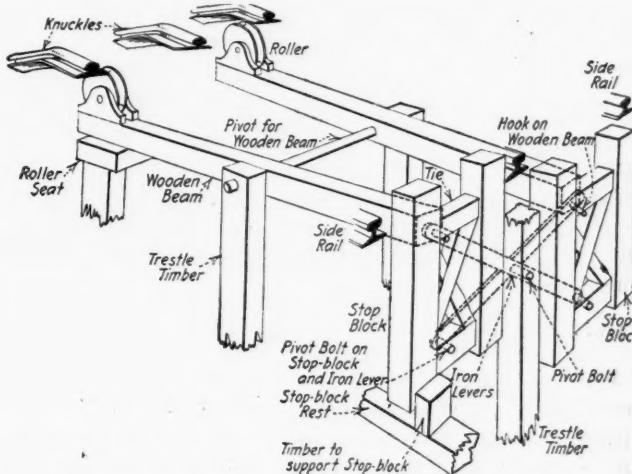
The stop-blocks are made to operate automatically by placing a roller for the cable on the knuckle between each track. The frame in which this roller revolves is set on the end of a 4x10-in. timber, about 6 ft. long, placed lengthwise with the track and underneath it. This beam is pivoted at its middle so that its ends are free to swing up and down, the pivoting bar being fastened to the timbers of the trestle underneath the knuckle.

A support or seat, underneath the end of the beam on which the roller is fastened, prevents it from dropping more than 4 or 5 in. and takes all the weight of the cable pulling down on the roller.

The other end of the beam is provided with an iron hook which engages the eye of an iron lever. This end of the beam is also weighted down by means of several old car wheels firmly clamped to it. The iron lever is placed crosswise to and reaches from center to center of the tracks. A pivot in its middle allows both ends to swing up and down.

The other end of this iron lever is pivoted by an iron bolt to the bottom of the stop-block frame, which is on the opposite track from the one under which the wooden beam and roller is placed. The up-and-down motion of the roller on the one track raises and lowers the stop-block on the opposite track.

The car-wheel weights on the end of the wooden beam must be sufficiently heavy to pull one end of the iron lever



STOP-BLOCK PLACED AT THE KNUCKLE

down and thus raise the stop-block which is fastened to the other end of this lever. When the roller is depressed by the downward pressure of the pulling cable, the stop-blocks are lowered. When there is no tension on the cable, the weights on the end of the wooden beam raise the roller and the stop-block on the opposite track.

The levers, etc., under each track are duplicates. The iron bar on which the wooden beam swings must be placed a sufficient distance from the roller to allow the other end of the beam to swing far enough to lower the stop-blocks clear of the cars when the roller is depressed.

Rests are placed underneath the stop-blocks to hold them when they have been sufficiently depressed to clear the cars.

AN AUXILIARY STOP-BLOCK IS EMPLOYED

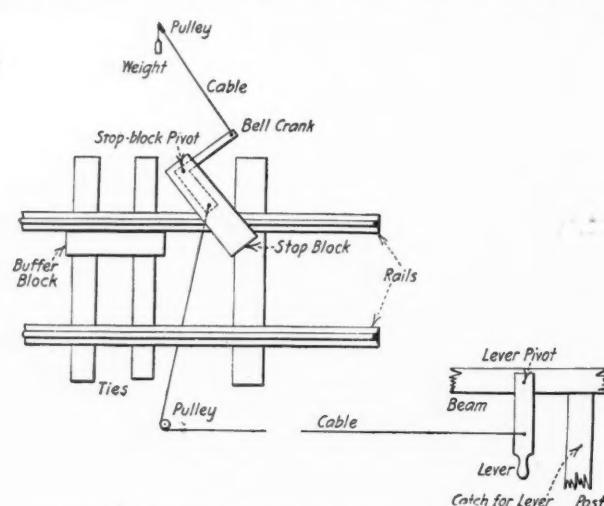
An auxiliary stop-block is placed over the middle rail, above the automatic device. This is made by taking a 6x6-in. timber about 2 ft. long and hinging one end so that it will swing horizontally over the rail.

This piece of timber is well ironed. An iron pin passing through one end and down into a heavy tie furnishes the pivot upon which it may move. When it is swung across the rail, the other end comes in contact with the end of a timber or block thick enough to reach about 4 in. above the rail. This is laid lengthwise of the track and

*Mining engineer, Roslyn, Wash.

spiked to the ties. This holds the timber firmly in position across the rail for the car wheel to bump against.

A bell crank is fastened to the bottom of this pivoted timber on the pivoted end. From one arm of the bell crank a cable or chain passes to the side of the track and over a pulley. A weight is attached to the end of this cable, which holds the block off the top of the rail and



AUXILIARY STOP-BLOCK PLACED ABOVE KNUCKLE

parallel with it. From the other arm of the bell crank a cable passes to the other side of the track over a pulley and up to the top of the landing or parting. The cable crosses the track under the rails.

At the upper end of the parting the cable is fastened to a lever. When it is desired to pull the stop-block across the rail, the lever is pulled and made fast by a pin or catch. The weight on the end of the cable pulls the stop-block off the rail as soon as the lever is released.

The cars are lowered out of the mine to the top of the incline landing on a single track by an engine placed at the mouth of the mine. At the end of this single track, where it connects with the top of the incline landing, a derail switch is kept open to handle runaways.

Bell cranks and iron rods lead to a lever placed beside the engineer in the engine room and give a positive motion to the switch, which he closes when a trip is hauled over it. The company has but few runaways, and all that occur are caught by means of these safeguards before they do any damage.

LOWER END OF TURNOUT HAS A SELF-ACTING SWITCH

The upper half of the incline above the turnout where the two trips pass is a three-rail double track. The upper end of the turnout needs no switch. The two outside rails are spread the necessary distance apart, and the center rail branches Y-shaped into two rails, which are laid far enough apart to give the necessary clearance for the passing trips of cars, making a double track of four rails. From the lower end of the turnout to the tipple only a single track is laid. A switch is therefore necessary at the lower end of the turnout.

This switch is self-acting. The bridle of the latches is connected to an upright lever placed in a switch stand beside the track. Weights are placed on the top end of this lever, which moves from side to side as the latches are moved from one side to the other by the descending trips. The weight holds the lever down and the latches in place on the one side until the trip goes up. The next trip

descends on the other track and throws the latches over, pulling the lever with its weight over also. The weighted lever again holds the latches in place for this track and for the next ascending trip.

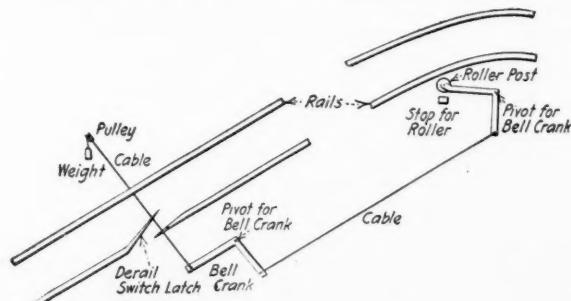
The single track has an automatic derail switch at its lower end near the tipple. At a distance equal to about two trip lengths above the derail switch the track makes a slight curve, which necessitates a roller post to keep the cable from swinging off the incline.

This guide roller is about 18 in. long and is set vertically and mounted on the end of the arm, about 6 ft. long, of a bell crank. The roller is placed on the lower end of the arm, and the upper end is pivoted to a tie or some other suitable support.

The other bell-crank arm extends out at right angles to the track. A small cable or wire is fastened to the end of this arm and extends down the incline to the derail switch, where it is made fast to the arm of another bell crank extending at right angles to the track. This crank is also pivoted to a long tie or suitable support. The other arm of this bell crank, extending down the incline, is connected by a short cable to the derail switch. The cable is continued across the track to the opposite side, where it passes over a pulley, a weight being attached to pull the switch open.

When the trip is below the roller post, carried on the bell crank at the curve, the hoisting rope presses against the roller, which being free to move, operates the bell cranks and cable, thus holding the derail switch firmly closed as long as the trip is below the roller post and the rope is in tension.

In order that the sidewise motion of the roller will not be more than is necessary to operate the switch, a stop or seat is placed back of it to prevent it from going too far. Where a roadbed is on a level with the ground, in



DERAIL SWITCH NEAR TIPPLE

order to hang the weights on the ends of the cable wells may be dug a few feet deep and about a foot square and curbed up with planks or the cable may be carried under a pulley at the side of the road and up several feet over another pulley fastened between two uprights, the weights being attached to the end of this cable.

That the Demand for Cheap Coal by manufacturers and the public generally can be carried too far has been often demonstrated. The sacrifice of life and limb in the colliery districts makes this abundantly clear. No one denies that competition can become so keen as to lead to the occurrence of accidents, for what applies at works on the surface must hold good to even a greater degree, down the mine in the bowels of the earth. If only the miner could attend more leisurely to his task of getting the coal it is possible there would not be so many accidents, but the modern conditions are against him in this respect. As things are, it often happens that one miner is anxious to get more coal than his neighbor, and in course of time he may pay the penalty of haste.

Meeting of the Alabama Coal Operators' Association

The sixth annual meeting of Alabama coal-mine officials was held under the auspices of the Alabama Coal Operators' Association at the Edgewater mines of the Tennessee Coal, Iron & R.R. Co. on Saturday, July 10, 1915.

The program as given out—which was published in *Coal Age* of July 3—was carried out to the letter, except that two extra features were added. First, Dr. Lloyd Nolan, superintendent of the Department of Health of the Tennessee Coal, Iron & R.R. Co., gave an

dition to that he has already accomplished much by his work in Alabama. He has the gift of being able to cover his subject fully and in a convincing manner by simply making a few startling statements. Here are a few of them, quoted from memory:

"Ninety-five per cent. of all flies are bred in stables. If all stables were cleaned out daily, the wet manure being either spread out on the ground to dry or treated with borax or sulphate of iron, flies would become curiosities. Even if all manure were hauled out weekly and burned, the same statement would be true."

A manager sitting next to the writer remarked that henceforth his stableman would have little idle time on



TAKING A PHOTOGRAPH OF THE MEMBERS WITH A REVOLVING CAMERA

impromptu talk following the motion pictures illustrating "The Fly Pest" and "War on the Mosquito." Second, demonstrations were given in an explosion gallery to show the comparative action of safety explosives and black powder when fired in the presence of dust.

The prepared papers will be published in full or in part in future issues of *Coal Age*; so no comments on them are necessary; but the remarks of Dr. Nolan, being impromptu, call for discussion.

To begin with, Dr. Nolan did important work in sanitation at Panama, so he speaks with authority. In ad-

dition to that he has already accomplished much by his work in Alabama. He has the gift of being able to cover his subject fully and in a convincing manner by simply making a few startling statements. Here are a few of them, quoted from memory:

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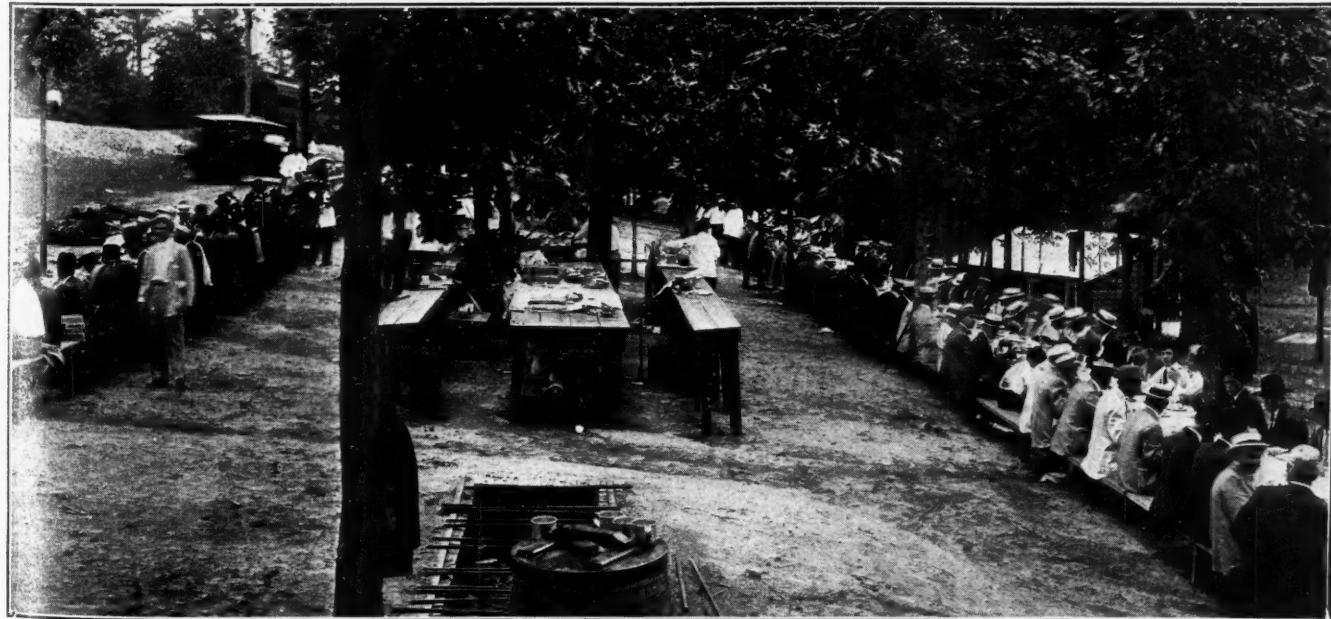
A manager sitting next to the writer remarked that henceforth his stableman would have little idle time on

his hands. He probably expressed in words what most of the managers present were silently thinking.

Then for fear that some of his audience might think he was indulging in figures of speech, Dr. Nolan added that the records at Panama bore out his statement.

Since all flies are not liable to be exterminated in the near future, the next statement had to do with the possibility of rendering flies harmless.

"Make all water-closets flyproof if you want to render most flies harmless," was the way the Doctor expressed it. Just to show that such a water-closet can be built,



LUNCHEON AT BAYVIEW BEFORE RETURNING TO EDGEWATER

there was one on exhibition just outside of the hall, and during the interim between the morning and the afternoon sessions most everyone present inspected it.

Dr. Nolan closed his case against the fly by stating that in his opinion typhoid fever would almost disappear from the health statistics of Birmingham if all of the 20,000 open closets could be done away with, and he based his conclusion on the fact that both the water supply and the milk supply in the city are far above the average.

His treatment of the mosquito was quite as impressive. He stated that there are two kinds of mosquito in Alabama—the Anopheles, which is the dangerous one, and the Culex or house mosquito, which is harmless. The Anopheles is the villain that is responsible for most of the malaria in Alabama. The Tennessee Coal, Iron & R.R. Co., acting under Dr. Nolan's directions, has proved the truth of that statement by reducing the number of Anopheles, and likewise reducing the number of cases

In his address of welcome President Charles L. Dering, of the Chicago Association of Commerce, and well known in the anthracite coal trade as the manager of the D. L. & W. interests in the West, urged the organization of a national coal association. He pointed to the need of such an organization, and declared that business men are regarded in a new light today. There was a time not long ago when business was represented in legislative halls only by seekers of special privilege; but a radical change has taken place in public sentiment and business now deals openly and squarely, and pleads its case on the merits of its cause.

Mr. Dering pleaded for a cessation of the bickerings and jealousies in the coal trade and advocated the formation of a national organization of dealers so that the trade may better work out its salvation through special committees. He strongly urged that the body form an organization which would stand for something and not for horseplay and unnecessary frivolity. In this connection



A LINEUP OF THE ALABAMA COAL OPERATORS' ASSOCIATION IN FRONT OF THE EDGEWATER TOWN HALL

of malaria. Getting rid of mosquitoes is the simplest thing in the world. Get rid of all stagnant water, and if you can't get rid of it, cover the surface with oil. Everyone knows that; but most people have lakes in mind, when as a matter of fact rain barrels and empty tin cans cause a good deal of the trouble.

Dr. Nolan's talk carried conviction. It now remains to be seen whether it will inspire action.

Taken all in all, the meeting was one of the most instructive that the association has ever held, and it was also very satisfactory from the standpoint of attendance. Priestley Toulmin, president of the Lehigh Coal Co., presided over the meeting, and Frank Crockard, vice-president of the Tennessee, Coal Iron & R.R. Co., assumed the rôle of "spieler" when the guests started out to inspect the mining equipment at Edgewater.

Chicago Convention of the Ko Koal

The national coal convention and tenth anniversary of the Order Ko Koal opened at the Auditorium Hotel, Chicago, on Monday afternoon, July 12. The meeting was one of the most important in the history of the order. Out of it there will probably grow a national organization to promote business and social relations in the coal trade of the country and to disseminate to the public and other business organizations facts and figures acquainting them with the actual situation of the fuel industry.

he said: "The present is a time of changed ideas. Business today views without alarm so momentous an innovation as the establishment of the Federal trade commission. A few years ago such a departure in national affairs could only have been regarded as a menace—a blow to the inalienable rights of business to work out its own salvation."

RESOLUTIONS ADOPTED

A resolution was adopted, reading in part as follows:

That the Order of Ko Koal be continued in fact, and that all horseplay be eliminated and absolutely prohibited from all of its initiatory ceremonies.

That in every program given under its auspices educational features must predominate.

That a bureau be established to collect, prepare and disseminate facts and figures covering cost of production, distributing and retailing of the various grades of coal from the mines to the consumer, in order to show the less-informed members of the trades as well as the consumer what constitutes a reasonable price for coal in different sections of the country.

That plans be formed to present this information to local chambers of commerce, business-men's associations and in other ways to promote the best interests of all branches of the coal industry.

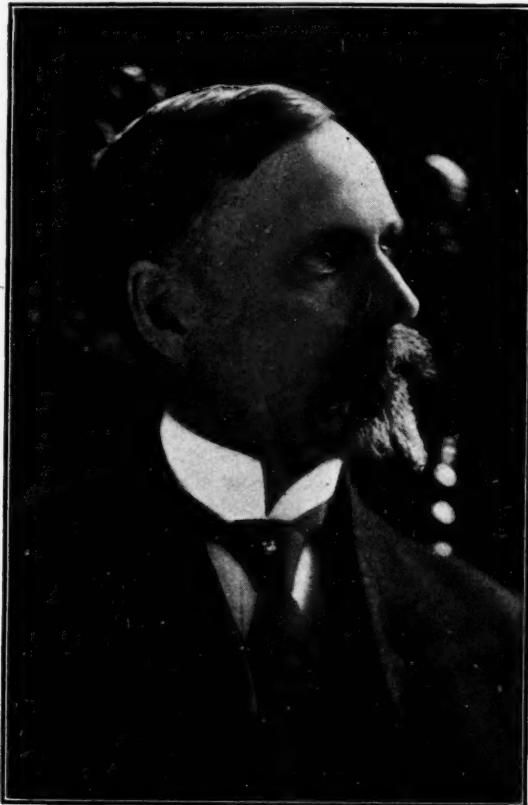
At the banquet, which was held at 6:30 in the evening at the Auditorium Hotel, the suggestion of Mr. Dering that the body form a national organization was enthusiastically adopted. F. S. Peabody presided, and among the speakers were Homer D. Jones, of Chicago, Charles F. Kerchner, of Baltimore, and H. C. McKinney, of Kansas City. President C. M. Moderwell of the Illinois Coal

Operators' Association delivered a very interesting address, his subject being "The Advantage of a Definite Aim." Walter S. Bogle, dean of Chicago coal men, in dwelling on his subject, "How Selling Prices Kept Up with Rising Costs," stated that the public has no idea of the number of coal companies now in bankruptcy, and that the profits of coal operators are decreasing each year owing to increased cost of labor, liability insurance and other factors little known by the public, which has increased the cost of operations.

* *

Death of Charles C. Rose

The coal-mining industry has lost one of its oldest and most widely known colliery officials in the death of Charles C. Rose, general superintendent of the Delaware & Hudson Co., on Saturday, July 17. Mr. Rose would have celebrated his 78th birthday on Sunday last, and



CHARLES C. ROSE

although recently he did not enjoy robust health, his illness was not considered serious until about eight weeks ago.

He was born at Rose Points, near Port Jervis, N. Y., of old New England stock, his ancestors being among the first Puritans who settled in this country. When 14 years of age Mr. Rose accepted a position with his father's firm, leaving it a short time later to enter the employment of the Erie R.R. While holding the latter position he took up the study of engineering, and through this preparatory work secured a position as civil engineer with the New Jersey Midland R.R. Co. His next connection was with the Delaware & Hudson Co. on operations in the vicinity of Lake Champlain.

In 1882, after having completed work for the Delaware, Lackawanna & Western Co. in the construction of a new railroad line west of Binghamton, N. Y., Mr.

Rose moved to Scranton and became assistant chief engineer for the D., L. & W. Co. He continued in the employ of this company until 1896, when he was offered a position as assistant superintendent of the Delaware & Hudson Co.'s coal mines. One year later he was advanced to the important post of general superintendent of all the coal-mining operations of the D. & H. Co., and continued to serve in that capacity until the time of his death.

Mr. Rose was married twice. He had one son by his first wife and one by his second wife. Both sons and his wife, Emma B. Rose, survive him.

Mr. Rose was a quiet, unassuming man who avoided publicity at all times. He succeeded in advancing himself to a place of eminence in the anthracite industry. As a mark of unusual respect for the man who rendered so many years of faithful service all the Delaware & Hudson collieries were closed at noon on Monday of this week. A host of friends, most of them old employees, attended the funeral.

* *

American Coal Sold in Sweden

Through the efforts of the consulate-general the Swedish state railways have purchased 100,000 tons of West Virginia coal, says Consul-General Ernest L. Harris, of Stockholm, Sweden, in *Commerce Reports*. Including the purchases in February, the total amount of American coal recently sold to the Swedish state railways is 120,000 tons. Private industrial enterprises in Sweden also use large quantities of coal. Sweden consumes over 4,000,000 tons of coal annually, chiefly coming from England, which has put an embargo on coal.

Recent Legal Decisions

Duty to Safeguard Setscrew on Shaft—In a suit for injury to a 19-year-old boy whose arm was caught by a setscrew on a revolving shaft while he was attempting to tighten a takeup on a jig shaft at a colliery, it was a question for the jury to determine whether defendant coal company was negligent in failing to box or guard the shaft. (Pennsylvania Court of Common Pleas, DeCrisse vs. Lehigh Valley Coal Co., 43 Pennsylvania County Court Reports 126.)

Enforcement of Mining Contracts—If a contract for removal of coal from a mine gives the owner of the mine the right to indefinitely postpone operations, there is such want of mutuality of obligation that the agreement can be terminated at the will of either party. If the contract is silent as to the time for its performance, the law presumes that the parties intended that it will be performed within a reasonable time, considering all the attending circumstances. The terms of a written contract cannot be contradicted by showing a trade custom at variance with such terms. (Alabama Supreme Court, Pratt Consolidated Coal Co., 68 Southern Reporter, 63.)

Assumption of Risk by Miner—If a dangerous condition in a mine resulting from props being placed too close to a track was obvious, a miner assumed the risk of being injured in consequence of that condition. (Kentucky Court of Appeals, Walker's Administrator vs. Bon Jellico Coal Co., 175 Southwestern Reporter 628.) Although an experienced miner was injured through fall of slate in a room neck wherein he was engaged in blasting down and removing coal after the same had been cut under by other employees, he cannot recover damages against his employer if it was his own duty to inspect the roof as the work progressed to ascertain its safety and if he had just blasted down coal under the slate which fell. In such circumstances he had the best opportunity to determine the safety of his working-place. (Same court, Stratton vs. Northeastern Coal Co., 175 Southwestern Reporter 333.)

New York City's New Coal Specifications

SYNOPSIS—An analysis of the new specifications to be adopted shortly. The tonnages purchased under this plan aggregate half a million. The specifications have been evolved from years of experience and careful study. The main changes are in anthracite coal, in which radical readjustments have been made.

New York City coal men will be interested in the new set of specifications under which it is proposed to purchase all coal intended for use in the various city departments of Greater New York, amounting to more than half a million tons. These new specifications have been prepared after three months' careful thought and work by a special committee of representatives of the largest coal-using departments, who have collaborated with the Bureau of Standards of the Board of Estimate and Apportionment.

A RADICAL CHANGE IN THE BUCKWHEATS

The most important change in the specifications has been made in the table of analysis. Of these changes the ash per cent. allowed for No. 3 buckwheat stands out most prominently, this having been reduced from 19 to 16 per cent. In view of this and other changes, the Bureau of Standards has seen fit to reverse the order of these sizes, placing No. 3 first on the list of buckwheat coals and Nos. 2 and 1 following in the order named. In changing the ash percentages for the buckwheat coals the committee sent out special investigators and learned that large individual users of these coals, especially No. 3, were able to obtain coals giving a 14 per cent. ash with from 13,900 to 14,000 B.t.u., while the city was being supplied with coals giving from 18 to 23 per cent. ash and running from 11,500 to 11,900 B.t.u.

In view of the fact that the various city departments in 1914 used 124,000 tons of No. 1 buckwheat, 20,499 tons of No. 2 and 62,517 tons of No. 3, the committee determined to devise a method for getting a better quality of this grade and therefore raised the standards. It was also learned, according to the committee, that the city was paying from 15c. to 25c. more per ton for its No. 3 buckwheat coal than certain individuals were paying, although the latter, it is claimed, were getting a better quality of fuel.

It has been decided that if a sufficient supply of these smaller coals can be obtained, wherever possible they shall be substituted for the larger and more expensive grades.

NEW ANALYSIS AND BONUSES

The table of analysis in the new specifications is as follows:

Sizes	Moisture*	Ash†	Volatile†	Sulphur†	B.t.u.†
Broken	4	9	9	1.5	13,500
Egg	4	11	9	1.5	13,200
Stove	4	12	9	1.5	13,000
Chestnut	4	12	9	1.5	13,000
Pea	5	16	9	1.5	12,400
Buckwheat No. 3...	6	16	9	1.5	12,400
Buckwheat No. 2...	6	18	9	1.5	12,200
Buckwheat No. 1...	6	18	9	1.5	12,200

*As delivered. †Dry coal.

The table of analysis in the former specifications, which have been in force for more than four years, is as follows:

Sizes	Moisture*	Ash†	Volatile†	Sulphur†	B.t.u.†
Broken	4	11	8	1.5	13,200
Egg	4	11	8	1.5	13,200
Stove	4	12	8	1.5	13,000
Nut	4	12	8	1.5	13,000
Pea	4	12	8	1.5	13,000
Buckwheat No. 1...	6	18	8	1.5	12,200
Buckwheat No. 2...	6	19	8	1.5	12,100
Buckwheat No. 3...	6	19	8	1.5	12,000

*As delivered. †Dry coal.

In providing for the "Correction of Ash" the specifications say:

For each 1 per cent. of ash in the broken size in excess of the standard of 9 per cent. and up to and including 11 per cent., the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 11 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 1 per cent. of ash in the egg size in excess of the standard of 11 per cent. and up to and including 13 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 13 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 1 per cent. of ash in stove and chestnut sizes in excess of the standard of 12 per cent. and up to and including 14 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 14 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 1 per cent. of ash in the pea and buckwheat No. 3 sizes in excess of the standard of 16 per cent. and up to and including 18 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 18 per cent. the gross weight of coal shall be at the rate of 2 per cent.

For each 1 per cent. of ash in buckwheat No. 1 and buckwheat No. 2 sizes in excess of the standard of 18 per cent. and up to and including 20 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 20 per cent. the gross weight of coal shall be at the rate of 2 per cent.

Reductions in the gross weight of coal for excess ash above the standard of 9 per cent. for broken sizes, up to and including 11 per cent. in excess of the standard of 11 per cent. for egg size, up to and including 13 per cent. in excess of the standard of 12 per cent. for stove and chestnut sizes, up to and including 14 per cent. in excess of the standard of 16 per cent. for pea and buckwheat No. 3 sizes, up to and including 18 per cent. and in excess of the standard of 18 per cent. for buckwheat No. 1 and buckwheat No. 2 sizes, up to and including 20 per cent. in deliveries, shall be offset by remitting such reductions made on the 1 per cent. basis at the rate of 1 per cent. for each 1 per cent. on the amount of coal in other deliveries under the same contract at the same unit price which contains ash below the standards of 9 per cent. for broken size, 11 per cent. for egg size, 12 per cent. for stove and chestnut sizes, 16 per cent. for pea and buckwheat No. 3 sizes and 18 per cent. for buckwheat No. 1 and buckwheat No. 2 sizes. No deductions made on the 2 per cent. basis shall be remitted. The percentages of ash shall be computed to the nearest tenth of a per cent. All such remissions of reductions in the gross weight of coal shall be made upon the final payments under contracts for coal delivered.

THE CORRECTION FOR THE B.T.U. VALUE

In the specifications which will be superseded it is provided that "the gross weight of coal after correction for excess of moisture shall be reduced at the rate of 1 per cent. for each per cent. of ash in excess of the standard analysis specified for the particular kind and size of coal delivered."

In the correction for deficiency in B.t.u.'s the specifications provide as follows:

For each 100 B.t.u. in broken size below the standard of 13,500 B.t.u. per lb. of dry coal and down to and including

13,200 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 13,200 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in egg size below the standard of 13,200 and down to and including 12,900 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 12,900 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in stove and chestnut sizes below the standard of 13,000 and down to and including 12,700 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 12,700 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in pea and buckwheat No. 3 sizes below the standard of 12,400 and down to and including 12,100 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 12,100 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in buckwheat No. 1 and buckwheat No. 2 sizes below the standard of 12,200 and down to and including 11,900 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 11,900 the gross weight of coal shall be reduced at the rate of 2 per cent.

In order that the successful bidder shall be reimbursed should some of his deliveries exceed the quality called for by the contract, the specifications say that reductions in the gross weight of coal for deficiencies in B.t.u. below the standards specified in the paragraphs relating to correction for deficiency shall be offset by remitting such reductions made on the 1-per cent. basis at the rate of 1 per cent. for each 100 B.t.u. that coal in other deliveries under the same contract at the same unit price contains B.t.u. in excess of the standards set forth in the table of analysis. No deductions made on the 2-per cent. basis shall be remitted. The deductions in B.t.u.'s shall in every case be computed to the nearest 50 units.

CORRECTIONS FOR GROSS WEIGHT

The former specifications simply provided that the gross weight of coal, after correction for excess moisture, should be reduced at the rate of 1 per cent. for each 100 B.t.u.'s below the standard heating value specified in the analysis for the particular kind and size of coal delivered.

In providing for the aggregate reductions in gross weight the specifications read as follows:

After the correction for excess moisture shall have been made as herein specified, all percentage in reductions as herein described to be made on account of a deficient number of B.t.u. per pound, and all percentage in excesses of ash, volatile combustible matter and volatile sulphur shall be aggregated and totalized, and shall be deducted as a whole, and each payment shall be made only for the balance of the gross weight of coal delivered at the price bid per unit, except that, before the final payment is made under a contract, deductions in the gross weight of deliveries of 1 per cent. made for deficiencies in B.t.u. as herein described shall be offset by remitting such deductions at the rate of 1 per cent. for each 100 B.t.u. that coal in other deliveries under the same contract at the same unit price exceeds the standard given herein, and that deductions in the gross weight of deliveries of 1 per cent. for excess of ash as herein described shall be offset by remitting such deductions at the rate of 1 per cent. for each 1 per cent. that the amount of coal in other deliveries under the same contract at the same unit price contains ash below the standard given here. The total offsetting tonnage shall never exceed the tonnage deductions on the 1 per cent. basis for ash and B.t.u., nor shall offsetting tonnage on coal at one unit price be remitted from reductions on coal at a different unit price. Deductions made for excess moisture, volatile combustible matter and volatile sulphur shall not be remitted.

CHANGES IN SEMI-BITUMINOUS

The changes provided for the purchase of semi-bituminous coal are not so pronounced, as can be seen by a comparison of the tables of analysis in the new spe-

cifications and in the old, as shown in the following tables:

Sizes	NEW				B.t.u.†
	Moisture*	Ash†	Volatile†	Sulphur†	
Run-of-mine	3	9	25	2	14,000
Lump	3	9	25	2	14,000
Chestnut	3	9	25	2	14,000
Slack	3	11	25	2	13,600

Sizes	OLD				B.t.u.†
	Moisture*	Ash†	Volatile†	Sulphur†	
Run-of-mine	3	10	25	1.75	13,800
Lump	2.5	9	25	1.5	14,000
Chestnut	2.5	9	25	1.5	14,000
Slack	3	11	25	1.75	13,600

*As delivered. †Dry coal.

CORRECTION FOR ASH

The gross weight of coal, after the correction for excess moisture, shall be reduced as follows:

For each 1 per cent. of ash in run-of-mine, lump and chestnut sizes in excess of the standard of 9 per cent. and up to and including 12 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 12 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent. For each 1 per cent. of ash in slack size in excess of the standard of 11 per cent., and up to and including 13 per cent., the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 13 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

Reductions in the gross weight of coal for excess ash above the standard of 9 per cent. for run-of-mine, lump and chestnut sizes up to and including 12 per cent. and in excess of the standard of 11 per cent. for slack size up to and including 13 per cent. in deliveries shall be offset by remitting such reductions made on the 1 per cent. basis at the rate of 1 per cent. for each 1 per cent. on the amount of coal in other deliveries under the same contract at the same unit price which contains ash below the standard of 9 per cent. for run-of-mine, lump and chestnut sizes and below 11 per cent. for slack size. No deductions made on the 2 per cent. basis shall be remitted. The percentages of ash shall be computed to the nearest tenth of a per cent. All such remissions of reductions in the gross weight of coal shall be made upon the final payments under contracts for coal delivered.

METHOD OF WEIGHING BITUMINOUS

The old specifications simply provided that the gross weight of coal, after the correction for excess of moisture, should be reduced 1 per cent. for each per cent. of ash in excess of the amount allowed in the standard analysis specified for the particular kind and size of coal delivered and that the percentage of ash should be computed to the nearest tenth of a per cent.

To establish the gross weight after correction for excess moisture the specifications provide that:

For each 100 B.t.u. in run-of-mine, lump and chestnut sizes below the standard of 14,000 B.t.u. per lb. of dry coal, and down to and including 13,500, the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 13,500 the gross weight of coal shall be reduced at the rate of 2 per cent. For each 100 B.t.u. in slack size below the standard of 13,600 and down to and including 13,300 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 13,300 the gross weight of coal shall be reduced at the rate of 2 per cent.

Reductions in the gross weight of coal for deficiency in B.t.u. below the standard of 14,000 for run-of-mine, lump and chestnut sizes down to and including 13,500, and below the standard of 13,600 for slack size down to and including 13,300 in deliveries, shall be offset by remitting such reductions made on the 1 per cent. basis at the rate of 1 per cent. for each 100 B.t.u. that coal in other deliveries under the same contract at the same unit price contains B.t.u. in excess of the standard of 14,000 for run-of-mine, lump and chestnut sizes and in excess of the standard of 13,600 for slack size. No deductions made on the 2 per cent. basis shall be remitted. The deductions for deficiencies in B.t.u. shall be computed to the nearest 50 units. All such remissions of reductions in the gross weight of coal shall be made upon the final payments under contracts for coal delivered.

How premiums may be secured by the delivery of coal in excess of the requirements of the contract is provided for as in the specifications relating to anthracite coal.

The Labor Situation

SYNOPSIS—Much interest centers around the meeting of District No. 1 at Scranton, Penn. The radicals there, as in West Virginia and Illinois, are disposed to break up the union. The South Wales strike appears to be settled, the men receiving a further increase in wage. The Munitions Act was powerless to restrain the strikers.

The miners in District No. 1 of the United Mine Workers of America who assembled on July 19 at Scranton, Penn., were jubilant over the condition of the union. There are 43,000 members in that district, with a cash balance in the treasury of \$81,000, which is only about \$1.89 for each member, and even less for each mineworker in the district. The union lists show an increase of 8000 since 1913.

There are members and enthusiasm, but there is little money; and it is a safe guess to state that the miners will get little more than the operators are prepared to concede them, for the miners elsewhere will hardly be able to contribute much owing to the slack work in the past.

However, there is no reason why concessions should not be received in the direction of the 8-hour day and perhaps recognition of the union—for the first has popular approval and the second, as far as the anthracite region is concerned, would probably be a guarantee of greater industrial peace, and therefore acceptable to the operators. The abolition of the conciliation board will not meet with public approval, though the fight is largely about names. Any other board would be but little different from that now sitting.

Method of Measurement Is a Cause of Discontent

The miners object to the arrangement which the Pennsylvania Coal Co., the Hillside Coal & Coke Co., and the Delaware & Hudson Co. have with their men, whereby a ton is rated at 2700 lb., that being supposed to net 2240 lb. after cleaning. There is a rebate if the coal gives a better result, and that rebate is usually received. The miners object to payment by the car where that is the system, and a change is likely to be urged by the union.

The miners have not by any means the unanimity which might be expected. A disruption is feared by the leaders, and the need for solidarity will be urged on the delegates. There is a radical element which is content with nothing. This element prefers the methods of the Industrial Workers of the World to the orderly methods of the union.

An Increase in Wage Demanded at a Pennsylvania Mine

The coal miners of the Shenango Furnace Co., at Wilpen, in Westmoreland County, Penn., went on strike on July 12 for an increase in wages of 10c. per ton. The company complained that the miners did not load their cars as high above the sides as they should, and the miners countered with the demand for higher wages. About 100 men walked out when the claim was not met. The company stated that it had a contract for a year calling for 950 tons per day and that it could only be filled at the present scale of wages. The records show that in 1913 this mine had 250 employees and the production was about 1000 tons per day.

Strikes for Run-of-Mine Weighing in Eastern Ohio

In Ohio the miners are discontent at the slowness with which mine-run weigh scales are being installed. The employees claim that the operators prefer to continue the temporary arrangements by which the slack produced is estimated and added to the weighings of the lump coal. About 2000 miners in Belmont County, Ohio, have gone on strike. It is not likely that the trouble will continue, as the operators are installing scales which will enable them to weigh the coal as it comes from the mines.

At Nelsonville, Ohio, the Manhattan Coal Co. has closed down two of its mines because some of its employees refused to accept a reduction in wages. About 500 men are idle. In 1913 the Manhattan Coal Co. had 825 employees. Its mines are in the Hocking Valley district, where the Sunday Creek Co. has recently closed all its mines.

In the eastern Ohio district conditions are better. Since the strike about 30 mines have gone to work and others are preparing to resume. The Maher mine of the Purseglove-Maher Coal Co. at Glencoe, which employs about 200 men, and the Johnson Coal Co. mine at Pipe Creek (Dilles Bottom P. O.), employing about as many, resumed work on July 15.

Dissension in Cabin Creek Labor Unions

Dissension has arisen in the unions in West Virginia and Illinois. On the failure of the district convention in Charleston, to sustain by its vote the charges of fraud in union elections, brought against certain officials of the union by Cabin Creek miners, a number of delegates from that district bolted the convention, declaring their intention of forming an independent union. It is reported that only 40 of the 63 delegates who advocated sustaining the charges left the meeting, and that they represent only a small number of the Paint and Cabin Creek miners; but the independents have called for a general convention to be held at Montgomery on Aug. 2, at which time a show of strength will be possible. Sweeping charges of questionable methods and machine politics on the part of present union officials are made by the independents.

Some further details of this dispute can be found in "Coal Age" of July 3. It is there stated that Thomas Haggerty was accused of using the funds of the union to secure the election of L. C. Rogers and his associates, but was exonerated by the International Executive Board.

A New Local Union of Moderates at O'Fallon, Ill.

A new local miners' union was organized on Friday, June 24, at O'Fallon, Ill., composed of dissatisfied members of the local United Mine Workers Union. The president of the local thus suffering from dissension is David Wilson. He is known as "King David." It is alleged that the socialists in the union, who compose 60 per cent. of the membership, have caused discrimination to be shown to their followers in apportioning work. The nonsocialists claim that there has been so much unrest and dissatisfaction among the miners that the companies could not operate to advantage and so have been running irregularly. They want to get back to work and have elected George Goodall president, Martin Gurney vice-president and several other officials to plan for peace and progress.

Violence Attempted at Fairmont, W. Va.

Three men were arrested at Fairmont, W. Va., on July 17 charged with plotting to dynamite the residence of former United States Senator Clarence Watson and three of his relatives, who are heads of the Consolidation Coal Co. The plot is generally thought to be due, not to labor troubles, for there are none, but to the fact that the company has been shipping coal to Great Britain and her allies. The men were arrested on the testimony of Roy Dunn, a 16-year-old boy, who while concealed heard the men discussing the plot. He was discovered by the plotters, who bound him and threw him into the Monongahela River, from which he barely escaped with his life. A suitcase full of dynamite was later found by officers near where the men had held their conference.

A Miner and Labor Leader in a King's Cabinet

It is interesting to note that William Brace, who began his career as a pit-boy in a Welsh coal mine at the age of 12 and worked as a miner for 12 years, has entered the new coalition cabinet in Great Britain as Under-Secretary of Home Affairs. Of course promotion even higher for representatives of labor is even commoner in Great Britain than it is here. Brace was a talented organizer, and it was largely owing to his efforts that the South Wales Miners' Federation was formed, of which he ultimately became president.

He did much to ally this body with the Miners' Federation of Great Britain. He entered Parliament in 1906 as a member of the Labor party. He is 50 years of age. He often preaches in the Baptist church. He looks more like a successful businessman than a miner, but he has not lost his democratic instincts or his sense of comradeship with those who have helped him to his present position.

South Wales Strike Is a Protest Against Munitions Act

The difficulty in South Wales, which appears at present writing, July 21, to be settled, is a political issue rather than a contest between capital and labor. The miners are striking at the Munitions of War Act, which compels them to accept arbitration and forbids them to strike under a penalty of a fine of about \$25 per day for each day of idleness. Their leaders, who have a broader knowledge of the situation than the miners, and who can stand off and view the war conditions comprehensively, have for the most part been trying to get the men back to work. So has the Federation of Miners of the United Kingdom. The labor leaders, at the recommendation of Lloyd George, Minister of Munitions, have agreed to settle the strike if granted a further increase of 10 per cent. in wages and other important concessions.

New Apparatus and Equipment

Safety Check Hook and Lock

At practically all coal mines of any size in the United States the check system has been adopted as a means of identifying the coal produced by the different miners. Each coal digger or loader is given a certain number of brass checks bearing his work number. He attaches one of these to each car that he loads out. When the car is dumped the check is removed and the coal which the car contained is credited to the man whose check it bore.

Much trouble has resulted from "stealing of cars"—that is, the removal of the rightful check and the substitution of another. By this means an unscrupulous miner may often get credit and receive payment for many cars of coal that he did not dig. It has been estimated that,

the car is level or nearly so, nor can one be removed except when the car is tilted 25 deg. or more as in discharging.

The illustration shows three views of this nonpickable safety check hook and lock. Figs. 1 and 2 are a front and a rear view of the apparatus, with a check locked in place. Fig. 3 shows the lock tilted sufficiently to allow the check to be removed.

This check lock renders it extremely inconvenient for the would-be "car thief" to substitute his check for that of the rightful "owner." Since it is possible to remove a check only when the car is tilted, as in the dumping position, a loaded car would have to be jacked or pried up to such a position before the removal of a check could be accomplished. This would require too much work

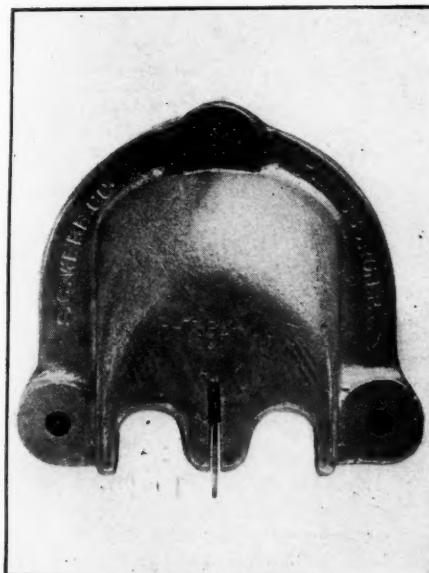


FIG. 1. FRONT VIEW

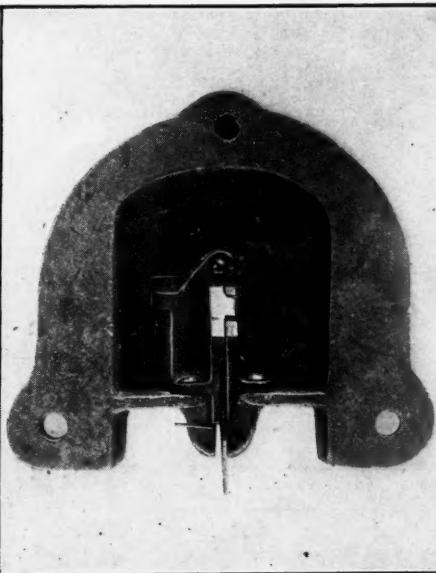


FIG. 2. REAR VIEW



FIG. 3. CHECK REMOVED

taking the country as a whole, each miner will average the loss of one car each month through this form of petty thievery. Furthermore, not infrequently a check becomes detached from its proper hook or nail and is lost; in which case of course the car of coal cannot be credited to the proper person.

To obviate these difficulties, the S. C. Webb Co., of Pittsburgh, Penn., has brought out the "check hook" shown in the accompanying illustrations. This "hook" consists of a gravity-operated padlock inclosed in a suitable cast-iron shield which is bolted or riveted to the left-hand side of the car. A check may be inserted in the slot provided for that purpose and locked securely in position. When the car arrives at the dump and is tilted 25 deg. or more, a slight upward pressure on the check, followed by a downward pull, quickly and easily removes it.

When the car has been returned to the mine and is level, or nearly so, another check may readily be inserted. A check cannot be inserted and locked in place unless

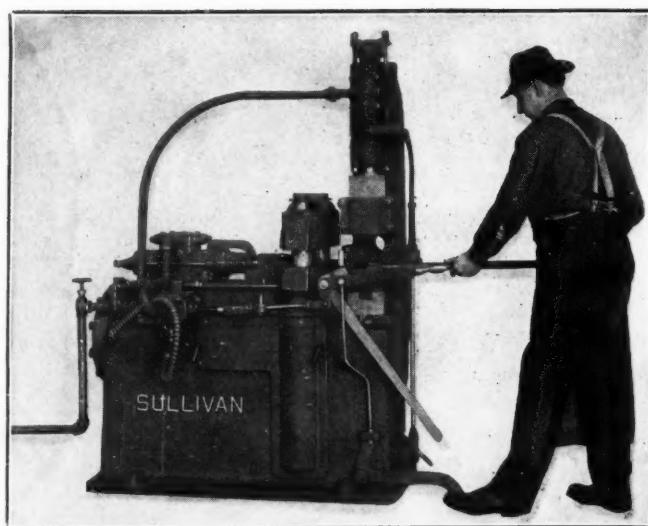
and take too long a time to be successfully accomplished. The new hook therefore protects the miner from loss. It also removes a prolific cause for suspicion and unrest among the miners.

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A New Drill Sharpener

A new machine for making and sharpening rock drills, as well as making chain machine bits and other blacksmith work around the mine, has been developed by the Sullivan Machinery Co., of Chicago, Ill. This machine in general follows the lines of the Imperial sharpener built for many years by T. H. Proske, of Denver, but is considerably larger and more heavily built, as well as being more powerful than its prototype.

This sharpener consists of two members, one being horizontal while the other is vertical. Each member is equipped with a Sullivan rock-drill cylinder provided with differential air-thrown valve motion. The horizontal hammer upsets the steel to the general shape of the



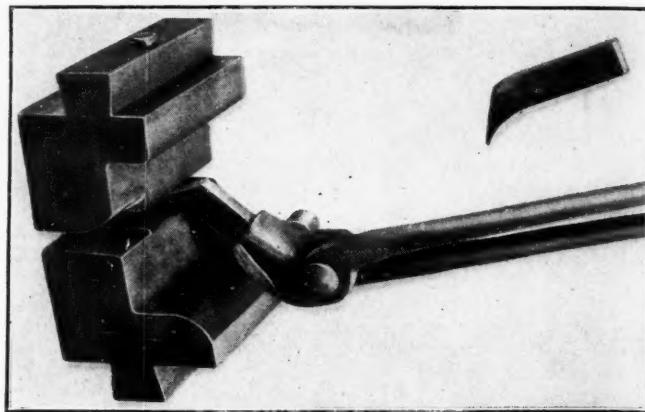
THE DRILL SHARPENER IN USE

bit or shank of the drill, while the vertical member is used for shaping the wings of the bit, etc., and for drawing out and finishing the corners. Steel dies are of course employed, one acting as an anvil and the other as a hammer, the latter being attached to the piston. While the drill steel is being upset it is held in position by a heavy vise operated by air pressure.

The new sharpener occupies a floor space of $5 \times 2\frac{1}{2}$ ft. and is 6 ft. high, weighing 4000 lb. Provision is made so that the operator cannot start the upsetting hammer until the clamp or vise is in operation. There is also a positive guard against operating the vertical hammer while the horizontal one is being used.

The control levers are so placed that the smith operates the machine with his left hand and left foot, the steel being easily held with the right hand. With a little practice a blacksmith may make a new drill steel in from 50 sec. to 1 min. and machine bits with equal rapidity.

Bits of any form or size may be made on this machine from steel of any shape, either solid or hollow. It is, however, of course necessary to furnish proper dollies and dies for the different sizes or shapes of bit. Drill steels are now being made on this machine, both cross and six-point rose shaped, for the ordinary hand hammer drills as well as for air-driven stoping drills extensively used in coal mines for light rock excavations, taking down roof, trimming walls or taking up bottoms of gangways or headings where the thickness of the coal measures requires such work. Dollies may also be made



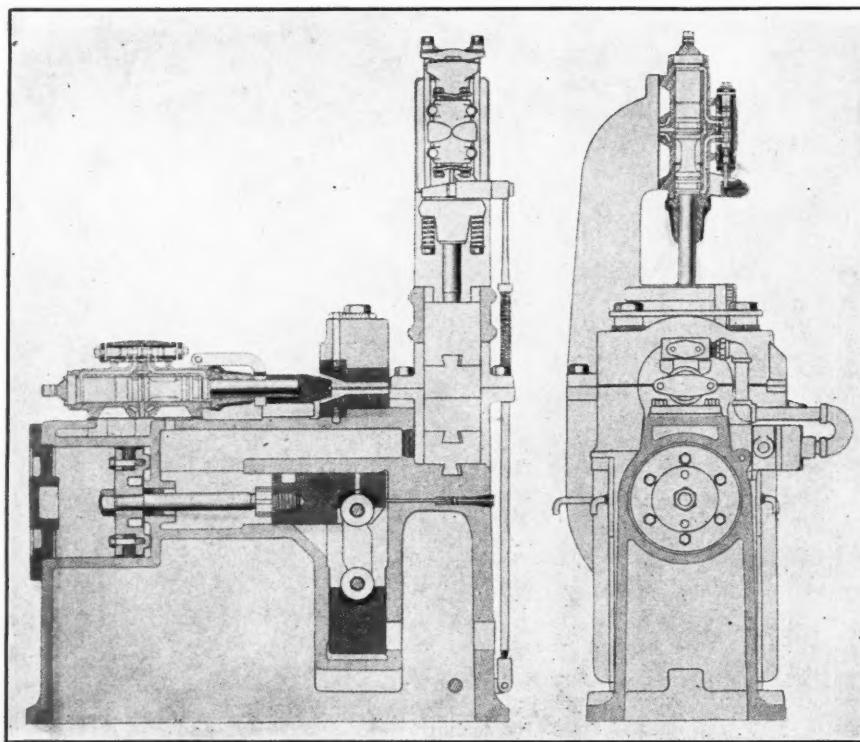
DIES FOR MAKING CHAIN BITS

for putting the lugs and collars on the shanks of hexagon and round drill steel required by various types of drills used for these purposes.

In addition to this the Sullivan sharpener will do a variety of special work, such as forging bolt-heads and making coupling pins for mine cars. Furthermore, by the aid of suitable dies and dollies, bits for use in the chain type of electrically driven or air-driven undercutter may be readily forged.

It has long been recognized that so far as the quality of the steel is concerned no improvement can be made upon the method of sharpening drill bits by hand. The constant hammering and working of the steel over the anvil secures a toughness and durability impossible by pressing or forming methods. This is, however, the exact result obtained by the use of this sharpener, since all shaping and forming are done by hammering. In addition to this, uniformity in the gage of the drill bits is secured, while steels may be sharpened or made from new stock at a much more rapid rate than is possible to attain by hand methods.

During the past few years many small portable compressor outfits have been sold for use underground. These drive small hand-held drills which are used during a great percentage of the time on rock removal. By the aid of this new Sullivan sharpener, steel suitable for use in these drills may be manufactured or sharpened with great uniformity and precision, as well as rapid dispatch.



SECTIONAL VIEWS OF THE MACHINE

Editorials

Ever a Better Beyond

The trouble with all our agreements in the coal industry is that they are regarded by the miners as only temporary arrangements, as contracts *ad interim*. There is no harm in making them binding for only short periods of time, with the idea that if conditions change there should be a change in scale. So, too, these documents should be recast occasionally to remove unexpected inadequacies or to provide for somewhat general changes in the public attitude to the labor problem.

But the union takes an entirely different view of the matter and has quite another reason for wanting a short-time agreement. It desires to raise the rate of compensation steadily without any regard to the demand for coal, its price or the cost of living. Its purpose is steadily to ask for more. "This," the union says, "is all we demand this time. Next time we will have other demands." This attitude is one which can only be right if the agreements made are always unfair to the miners and promise inadequate compensation for their labor, and if the work of arbitration commissions, if appointed, is always improperly performed.

When the unionized miners want a different contract from that under which they are working they should be able to show a new condition warranting a change in contract. If they cannot show it, their strife should be sternly reprobated by the public. The consumer should exhibit an uncompromising attitude to both operators and miners when they strive without modifying cause to disturb agreements which have been carefully adjudicated and on which a business has been assiduously built.

* * *

Housing Coal Miners

It was with full conviction that *Coal Age* is an open forum that we published the second article entitled "Why Are Strikes at Coal Mines of Such Frequent Occurrence?", for we cannot say it has our indorsement. Our remarks are limited at present, however, to that part of that article that refers to the house problem.

The rent of houses at mining villages was set many years ago, and with the years has not increased. Two decades ago miners and others lived on a lowly scale. The timber was cut from woods within a mile of the village to be built, and the mill which reduced the logs to boards and scantlings was probably even nearer. The houses quite frequently had no cellars and stood on posts. They were not painted and in most cases building paper, in rough red sheets held in place with loose-headed nails, lined the interior.

These houses, which sheltered now lumberjacks, now miners, were regarded as satisfactory dwellings in that primitive time. For no one came into that "neck of woods" unless he had the soul of a pioneer. He rather gloried in inconveniences, as people are wont to do who go hunting and build an insanitary hut and call it a bungalow or a shooting lodge.

All this rustic simplicity was comforting to the lumberman and mine owner. He made 30 to 50 per cent. per annum on the kind of house he furnished, as the lumber could be put down at the site for little over \$8 per thousand, perhaps a third what it is now; and there was little loss when the time came to move the town, for there was no masonry or plastering to be spoiled in demolishing the house, and the roof might even be clapboarded, and so redeemable in large part.

In those days there was indeed a large profit in houses. It was a "graft" only inferior to the company store and the railroad rebate. And it would have lasted had not the progress of civilization been promoted by the operator building a fine house at the county seat and by the lawyers and merchants in that same center following suit. Other causes for the change were the competition for miners and the advancing price of lumber.

In some places such houses are still rented. But nearly all the old mining towns have long since passed away and the newer towns, if not for humanitarian, at least for competitive reasons, have been better built. The walls of these dwellings are now plastered and wainscoted; the roofs are shingled, frequently with red cedar shingles, sometimes with slate, though tar paper is still not unknown. The walls after they become dirty are papered if the houses are occupied by English-speaking families. At the same time the price of lumber has risen and the labor required in erection has become more costly.

Only the rent is unchanged. That remains \$2 per room per month in Eastern mine villages. It is now a fair compensation for the houses supplied. These are four-roomed dwellings and can be erected in large quantities for about \$600. The water supply and fire protection, important items, are extra expenses. Such houses bring 16 per cent. per annum, when all losses and expenditures are not considered. This seems not a fair but a large compensation; but a little inquiry will show that it is by no means excessive.

The greater proportion of company mining villages do not last over 15 years, especially in western Pennsylvania, where the tonnage of a mine is large. It is true that some can be recalled which have been the seat of a post office for a much longer period, but the greater part of the time the mine has been running at much reduced capacity or is a poor producer at all times. Only a small proportion of the whole territory near large mines is working after 15 years, and as a result the houses are largely boarded up or pulled down and removed. A house which is plastered and has a cemented cellar is by no means removed with profit. It pays almost as well to erect a house from entirely new material.

So it is safe to reckon the obsolescence charge on a house as 6 $\frac{2}{3}$ per cent. Deducting this from the profit of 16 per cent., only 9 $\frac{1}{3}$ per cent. remains, and from this must be deducted loss of rent from empty houses, repairs, betterments, taxes, insurance, fence-building and whitewashing, collection, bad debts, uncovered fire losses,

village improvements, garbage collection, supervision, the replacing of overcharged cesspools, general sanitation, etc.

In cases where betterment plans are somewhat generally forgotten, the first five items are the chief ones. Even where the company is somewhat negligent repairs are frequently not to be overlooked. A Polander has been known in drunken moments to light a fire on the floor. The protecting boards between the posts supporting the house have been torn away for a cowshed and legends have been painted on the house front. Doors are broken and split, locks wrenches loose, windows broken and steps and stairways are hatchet worn. This cuts the profit down close to 6 per cent., or even lower.

But 5 per cent. is a bonanza for many bituminous coal operators. If only they could do as well at mining coal they would be wondrous glad. We should not be surprised when we hear them say that the houses and the store saved the day. We should not necessarily infer either that the day *had been* saved, as ordinary business would view it, or that in saving it the houses and store had yielded an unfair profit.

And it must be remembered that your operator is often blind and overlooks the needful amortization of nearly 7 per cent. In fact he is blind enough sometimes to brag a little when he is really losing money because he forgets the time when the whole property value will be wiped out and shuts his eyes to the possibility of rows of idle houses in the future.

The house problem is not settled by any means. It is not clear that a fair rent solves the problem. The National Housing Commission advocates a better house. Americans should live in houses with stationary wash-tubs, bathrooms and other conveniences, and there should be an adequate porch front and back. There should be good water in every house. But in that day rents in mining towns will be almost as high as in villages with private ownership.

The United States Coal & Coke Co. is giving a good 6-room house, with bathroom and a good cellar with coal bins, to some of its employees for \$12 a month. These houses have a hot-air furnace and are wired for electric lights. Such houses, which in boroughs would rent for \$25 a month, cannot pay a fair rate of interest, any more than those at Concrete City which were erected by the Delaware, Lackawanna & Western R.R. Coal Department. The subsidiaries of the United States Steel Corporation are getting a fair price for their coal from the parent company and can afford to run their houses with a low return.

By prudence they may be able to increase the life of their towns and thus save amortization charges. The values of anthracite towns are less affected by the passage of time, as the coal is thick and beds numerous. But the houses of the companies mentioned are rented far below what would be charged for the same dwellings in an open town.

The miner who moves to a borough with private ownership usually has to pay a price a half larger or twice as large for a slightly better house. He really pays more for what he gets, for the landlord has greater costs of collection, larger taxes, more risk of bad debts and no cause to offer inducements to the tenant. He has no coal he wants to see dug. He is only looking for rent, not for workingmen.

The remark of Mr. Archbald that men are compelled to rent houses really does grieve the fairminded man, for an operator is surely justified in hiring men who will rent from him when he has a string of idle houses which have often been built solely in order that his men might be accommodated. Would any reasonable man ask him to sustain a dead loss on his property year by year because the men prefer a cheap shack on the outskirts of his village to a reasonable house on the property built only for the benefit of employees and offering for rent at a fair price? One thing which makes rent so cheap in mining villages is the fact that a little discrimination in hiring keeps them full.

Rents are too low in mining towns and the houses not as fine as they should be. But until the miner is ready to pay more or legislation makes the operator face the problem rents and houses will both be much like they have been. The rents having become adjusted to the houses and the miner being opposed to a large rent, it is probable that the next decade will show less progress than the past.

xx

The War on Shipping

It appears that up to June 30 511 merchant ships had been lost as a direct result of the war and that this amounted to a shrinkage of nearly 1,000,000 gross tons, or 2 per cent. of the world's available merchant tonnage. Of this Great Britain lost 609,934 and Germany 102,062, or nearly 3 per cent. of their combined tonnage at the beginning of the war. The remainder of the loss was shared by the United States and 12 other nations. So great an inroad on the carrying trade—a loss sure to increase as the months pass—has a serious bearing on freighting all over the world.

Particularly is this true when one recalls that the shipyards of Great Britain and Germany, together with those of France and Austria, launched in 1913 no less than 2,635,231 gross tons in merchant vessels and that these plants, as well as those of most neutral nations, are now confining their efforts exclusively to war and naval construction.

The United States is of course a notable exception, but the ocean carriers now being built in American yards, while promising well for their owners, are likely to relieve but little the demand there will be at the end of the war. Besides the seven or eight lake steamers now being fitted for the coastwise trade, there are only seven steam colliers in process of construction on the Atlantic seaboard, and two of these are for Baltimore shippers who plan to inaugurate a regular coal service to the Mediterranean.

When the new coastwise boats are added to those now available, there will be only about 30 steamers engaged in freighting coal between Atlantic ports. While these will undoubtedly be sufficient for coastwise needs they will be able only occasionally to supplement the sailing vessels now so numerously engaged in trade to South America.

It is therefore evident that what tonnage is being projected is as a mere drop in the bucket when compared with the tremendous losses sustained on the other side of the Atlantic. Merchant shipping is in for a long period of high rates, and this indeed may soon be one of the world's grave questions.

Sociological Department

Resuscitation*

By W. S. ROUNTREE†

SYNOPSIS—Electric shock attacks the lungs or the heart or both. If the heart is dead or quivering it cannot deliver blood and therefore oxygen, and so artificial respiration is vain. But if the heart is working and the blood is unaffected, assisted breathing will in all cases restore the victim to normal condition.

The prime need for those who have been suffocated by mine gases or shocked by the electric current is to bring an immediate supply of oxygenated blood to the vital center of the body, for its deprivation of oxygen for 10 minutes may injure beyond repair some of the important brain cells, in which case recovery is unlikely.

When spontaneous breathing has stopped from any cause artificial respiration is the most valuable means for bringing back a normal condition of the body. But all methods are not equally useful for this purpose, even though they may cause an equal ventilation of the lungs.

CIRCULATION OF WORTHLESS BLOOD

Thus in simple asphyxiation, such as may be produced by electric shock, the nervous control of the muscles of respiration is temporarily paralyzed, while the heart continues to pump blood through the body. But this blood is not oxygenated by respiratory action, and the heart soon ceases to beat effectively and the victim dies from asphyxia. In such a case there is no poisoning of the blood, and ordinary air is all that the lungs need and artificial respiration, when applied, will supply it.

But if the victim is overcome by carbon monoxide, which is the principal poison found in the gases after an explosion and is the dangerous constituent of illuminating gas, oxygen should be used. Carbon monoxide, happily, does not form a permanent combination with hemoglobin any more than oxygen, but it unites with it or separates from it according to the partial pressure of oxygen and carbon monoxide in the air breathed.

The blood of a victim that has been exposed to carbon monoxide gradually becomes so saturated with the gas that it cannot readily absorb and therefore convey oxygen, and so the victim dies of asphyxia, not because the carbon monoxide is poisonous, nor because of lack of oxygen, but because the blood loaded with the monoxide is little disposed to be the vehicle by which oxygen is carried to the tissues.

If the victim is unconscious, but breathing in a normal manner, he may be allowed to inspire oxygen himself; otherwise artificial respiration should be performed and at the same time oxygen should be administered.

*Abstract of paper read before the Alabama Safety Association, May 1, 1915.

†Chief surgeon, Tennessee Coal, Iron & R.R. Co., Wylam Hospital, Wylam, Ala.

Electric shock may paralyze the nerves by which the muscles of the respiratory organs are controlled or it may do the same for the heart. When the heart is affected, it ceases to contract as a whole, but contracts in parts and apparently quivers, or "fibrillates." The action is so weak and ineffectual that it fails to keep the blood circulating, and death is the result. After such quivering has commenced no process yet discovered will restore the heart to normal action.

Alternating currents of high frequency applied to the heart increase the number of beats so that fibrillation, or quivering, does not occur. Oscillating currents of high potential materially aid in restoring the heart beat of dogs in conjunction with the perfusion of the coronary vessels with defibrinated blood. The evidence clearly shows that the higher the frequency of the current the greater the volume which can be delivered to the tissues without fatal results.

I have known a case in which a current of 6600 volts has passed through a man's body without killing him. On the other hand I have seen an alternating current of 110 volts cause instant death. While 200 volts is not ordinarily dangerous, any current of high voltage must be carefully dealt with if one would escape electrocution.

Crile and others have demonstrated that fibrillary contraction of the heart and respiratory paralysis are the chief causes of death from electric shock. Since the first cannot be cured, the hope of resuscitation lies wholly in proper treatment for paralyzed respiration. If the lungs are deprived of oxygen for 10 minutes, death ensues; so methods of resuscitation should be used immediately and continued till normal breathing recurs.

SCHAFFER METHOD IS THE BEST

The Schaffer method of artificial respiration is to be recommended as it is better than the Sylvester in that it is simpler and more easy to perform and provides greater ventilation of the lungs. It is also less likely to injure the ribs and liver. Moreover the tongue does not fall and block the air passages.

In treating electric shock the first-aid man must keep cool and follow instructions even if the victim appears dead. The electric circuit must either be broken or prevented from passing through the patient. This can be done by using a dry coat, a dry board or rubber gloves. The electric wire may be cut by an ax or properly insulated pliers or any other nonconductor. No metal or moist material should be used in endeavoring to rescue the victim. If his clothes are loose and dry, they may be used in pulling him off the wire, but in doing so use one hand and be careful not to touch the soles or the heels of his shoes as the nails in them are dangerous.

As soon as the victim is moved from the live conductor, a finger should be passed into his mouth and throat to remove all foreign bodies such as false teeth, tobacco or gum. The rescuer should not even stop to loosen the clothing, nor to remove the victim from the scene of accident, for every moment of delay is serious. Artificial respira-

tion should be continued for two hours, or longer if necessary, and in most cases it will bring the victim back to a normal condition. But if the current has exerted its power mainly upon the heart and that organ has ceased to beat, artificial respiration, while it will do no harm, can do no good, as the victim is absolutely dead.

Several medical devices for causing artificial respiration have been marketed in recent years such as the Pul-motor, Lungmotor and the apparatus which Dr. Meltzer has devised, but as yet the cases treated with the devices do not furnish absolute proof of the value claimed for them.

The primary and essential object of resuscitative methods is to supply the brain with a circulation of oxygenated blood. Cerebral anemia must be overcome within less than seven minutes or the patient will pass into a sleep which knows no awakening.

X

Keystone Coal & Coke Company Contest

The first-aid teams of the Keystone Coal & Coke Co., of Westmoreland County, will hold their fourth annual demonstration at Athletic Park on Sept. 4, the first Saturday in that month. General Superintendent H. F. Bovard and Chief Inspector William Nesbitt will be in charge of the meet and have announced that about 60 teams are expected to attend.

The big prize of the contest is the cup offered by the late Col. L. B. Huff. The cup must be won three years in succession. Crow's Nest won the prize at one of the meets, and Arona won the last year's contest with an average of 100 per cent. and has therefore established a claim on the cup. Several hundred dollars in cash will also be included in the list of prizes.

X

One Operator's Experience with the Liquor Problem

The following letter, from the Pittsburgh *Gazette*, has been sent by a subscriber, who requests that it be published:

At our works we have a mixture of races, as I have never believed in employing too many of any one nationality, although in the case I am about to relate, the mixture soured somewhat. About six months ago, shortly after the European war started, a number of our men one evening congregated at one of the houses for a little drinking bout, during which the trouble across the water was of course discussed, with the result that might have been expected—a free-for-all fight in which one man was shot and seriously wounded. The shooter, a fine workman, got away and is still away, and our entire force was disorganized for several days.

SUPERINTENDENT MADE A PERSONAL PLEA

This set me to thinking. I realized that the same thing was liable to happen every time any number of our employees got together where there was booze, and I finally decided to try the "water-wagon" plan. I had a list of those who regularly ordered beer and whiskey and I went personally to each man. I called attention to the shooting scrape and the resultant trouble and told them I had decided to ask them not to order any more intoxicants during the progress of the war; that while I had no intention of interfering with their personal privileges, this was a matter that concerned the good of the entire community and I felt justified in making the request. A large majority of the men received the proposition favorably. A few, however, rejected it on the ground that their rights were being interfered with. These men are not now working for us; they are exercising their rights and doing their drinking at some other works.

The result of the new order of things was a surprise to me. I had expected an improvement in conditions, but nothing to what happened. Right from the start we had no shortage in our labor supply; everybody was on the job; the men worked regularly; the usual "sick" list after lay-off days and Sundays was entirely wiped out; the coal came without a hitch, the ovens were charged in good time and everything moved along swimmingly.

MINERS WANTED MORE WORK

A little later several of the miners came to me and complained that they were not getting enough wagons to load. I investigated and found they were doing somewhat better than before the "reformation" started, and told them so.

"Me know," said a big Hungarian, "but want more wagon," and throwing out his chest and spreading his arms continued, "Me feel better no booze, want work all time now; can load one, two, mebbe three more wagon; loaf too much in pit now."

I promised to see what could be done and immediately went over the roll. I found a number of undesirables and weeded them out, and today we are operating our plant with 25 per cent. less men than when the war began, are getting done in better time, the men are in better condition physically and mentally and everything in general has improved wonderfully.

I believe, too, that the "reformation" is going to stay with us. Several of our hardest drinkers have told me that they are through with booze for all time. This sentiment is spreading among our people and we are encouraging it in every way.

TEMPERANCE HAS ELIMINATED ACCIDENTS

But the most gratifying result lies in the practical elimination of accidents in our mine. Heretofore it was almost a daily occurrence to have somebody injured. Most of the accidents were not serious, but they showed thoughtlessness and carelessness. They were disquieting and a continual jolt to the operation of the plant. Now, however, the men are going about their work intelligently. During the last six months we have not had a man hurt either inside the mine or out, and I want to tell you that a condition of that kind makes the man in charge feel mighty good.

Of course should there be a general resumption in the region there would be a shortage of labor. This has always been the case after an extended shut-down, and just now the war aggravates the situation, as the workers who are abroad cannot return. However, if the operators generally were to adopt my plan, I am satisfied that the effects of this labor shortage would be much less serious than appears on the face.

X

Somerset County First-Aid Meet will be held Sept. 4

The Somerset County Miners' First-Aid Meet, which has heretofore been held at Somerset, Penn., will assemble this year at Boswell, Penn., on Sept. 4. This will give a much larger number of miners an opportunity to attend the meet. Already preparations are being made to make this a holiday and a gala day. The Public Welfare Association has agreed to coöperate to this end.

Fifteen teams have promised to compete—the Consolidation Coal Co. teams at Meyersdale, Pine Hill, Shaft No. 123, Jenners and Acosta, the Merchants Coal Co. teams at Boswell, the Jenner-Quemahoning Coal Co. team at Jerome, the Quemahoning Coal Co. team of Ralphton, the Victor Coal Co. team at Holsopple, the Brothers-Valley Coal Co. team at Macdonaldton and the Knickerbocker-Smokeless Coal Co. team at Hooversville.

There will be events for one, two and three men and a full-team contest. Rules and discounts will be similar to those of last year. Contests for ladies' teams and for teams of boys from mining towns have been requested. Prizes will be offered as heretofore, and the American Mine Safety Association and the American National Red Cross are coöperating and will give their medals and certificates to the winners. An expert from the United States Bureau of Mines will aid in training the men before the meet takes place.

This meet, as those in the past, will be held under the auspices of the mining department of the state Young Men's Christian Association of Pennsylvania. The members of the local committee in charge of the Somerset first-aid meet are: F. W. Cunningham, state mine inspector, Somerset, Penn.; Samuel Steinbach, Somerset; Richard Maize, Jerome; John Gibson, Jr., Boswell; Ralph Zimmerman, Ralphton. It is not too late for other teams to enter. As there are 49 separate mining operations in Somerset County, many more entries should be received.

Discussion by Readers

The Pennsylvania Amendment

The mine foremen, assistant foremen and firebosses in Pennsylvania, who have qualified for the positions they hold by passing the examination, and who hold the certificate of competency granted them by the state examining board, have been much exercised of late by the passage of an amendment to the mining law providing for the employment of uncertified men in these positions.

A careful survey of the situation, however, warrants the conclusion that such fears are largely groundless. The general opinion seems to be that persons who desire to act as mine foremen and firebosses will continue to take the examination and receive certificates from the Department of Mines, as before, although the operators will have the right to select persons to act as mine foremen, assistant mine foremen and firebosses from the uncertified workers, while, at the same time, they assume responsibility for all official acts.

It may be stated with assurance, however, that there will not be many uncertified men employed in such official capacities, as coal operators will largely prefer to engage men who hold a state certificate of competency. There will, of course, be a few exceptions where an old employee has proven very valuable in the service of the company by reason of his long experience, efficiency and good character, and the company, being fully satisfied with his previous record and willing to assume all responsibility for his future acts, desires to retain him in its service in an official capacity, notwithstanding the fact that he has not passed the examination, owing to a lack of technical knowledge, and does not, therefore, hold a certificate of competency under the state law. It is recognized that the failure to hold such a certificate is, in a number of instances, due to the lack of early education, or a want of familiarity with the English language sufficient to enable a candidate to make a creditable showing in examinations.

J. T. BEARD.

New York City.

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Value of Coal Analyses

Letter No. 4—I have just read Bykem's letter, *Coal Age*, July 10, p. 60, and am pleased to note that he comes a little nearer to my idea than did Mr. Coupland in a previous letter.

Bykem argues, however: "To impose this duty of testing coal on the mine operator, as suggested by Mr. Near, is hardly just unless his commodity can be sold at an increased price."

Very well; let the mine operator charge a little more for his coal, if necessary. He would then be doing no more than what the coal-sales agency is doing now. Any sales agency must certainly have to charge a little more on account of the analysis. My suggestion is to make only one analysis, and that a reliable one. I believe this should be made by the party mining the coal.

Or a certain mine could sell all of its coal to one sales agency and trust that agency to make the necessary analyses. If the analyses are correct and the coal is sold on a heat-unit basis, the desired end will be accomplished, the cost to the consumer will be less, and he will be reasonably sure of getting the kind of coal suited to his purpose.

N. G. NEAR.

New York City.

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Sampling Coke

Letter No. 1—Referring to the inquiry in regard to sampling coke, *Coal Age*, July 3, p. 28, permit me to draw attention to a point that is of utmost importance in the sampling of coke for blast-furnace use. I refer to the ash determination, since every pound of ash in a ton of coke means more expensive fluxing, increased cost of smelting, useless cinder and less furnace capacity available for the production of metal. For this reason differences of opinion as to the ash content of coke for blast furnace use often cause bitter controversies.

In an investigation of this subject several years ago, I was surprised to find how much of the apparent ash content of coke was due to foreign material introduced in the process of grinding the sample. For instance, the analysis of a sample reported as containing 17 per cent. of ash showed that $\frac{1}{17}$ of this ash, or 1 per cent. of the weight of the sample, was iron abraded from a Braun pulverizer. It may be stated that the ordinary cast-iron bucking-board and muller much used in grinding samples to be tested introduces iron into the sample to the extent of from $\frac{1}{2}$ to 3 per cent.

Whether the grinding be done by machinery or by hand, this introduction of foreign matter in grinding can be cut down greatly by the use of manganese- or chrome-steel grinding plates.

As the seller of coke is vitally interested in the ash content of his product, it will pay him to look up this matter and see that his own sampling machinery as well as that of his customer is of the best possible quality. In case the customer is grinding samples on an ordinary cast-iron plate that perhaps is so old that the surface chill has worn through, it may pay the seller to make his customer a present of a new bucking-board.

It is impossible to determine the amount of this contamination with a magnet, for the reason that too much coke dust will adhere to the iron filings. It is necessary to treat the sample with a neutral copper-sulphate solution, agitate thoroughly, filter and wash the residue with hot water until entirely free from soluble copper salts. This residue is now dried and ignited and the ash tested for copper or treated directly with nitric acid to dissolve the copper. The weight of copper precipitated by the iron in this process is then calculated from the ratio of their respective atomic weights.

This method will not answer for the determination of any foreign material introduced by ball or pebble mills, but is very effectual where the grinding surfaces are of

iron. It may be objected that the original ash of the coke may have contained some iron which has been reduced to the metallic state by the red-hot carbon of the coke during the coking process. In answer to this argument, however, it may be stated that any iron in the coke is present as ferrous oxide and combined with silica to form ferrous silicate ($FeSiO_3$). But in any event the objection is scarcely valid, because if the coke sample is crushed in a silica-pebble mill or in an agate mortar, the iron in the coke does not react with neutral copper-sulphate solution, according to my results.

DONALD M. LIDDELL.

Elizabeth, N. J.

The Mine-Lamp Question

Letter No. 1—I want to offer a few comments urging the need of better illumination in mine workings, particularly at the working face. Much can be said to discredit the common open-light oil lamp used by a majority of miners. In my opinion this lamp should be consigned to the rubbish heap, where it rightfully belongs. It is unsanitary and often dangerous. Its light is uncertain, and although giving a better illumination than that afforded by the dim light of the safety lamp, it cannot be compared in this respect with the light of the electric mine lamp, which is being largely introduced in up-to-date mines at the present time.

Not long ago the experiment was made of comparing the wages or earning power of the miners working in two districts under similar conditions, except that the mines in one case were lighted with portable electric lamps used by the miners, while the men in the other district worked with other lamps, using either the common open light or the safety lamp. The results of this experiment were decidedly in favor of the electric light.

The brighter light afforded by the electric lamp not only increases the earning power of the miner, but overcomes the objection often urged that the dim light under which miners are forced to work is a large factor in developing the disease known as "miner's nystagmus." I remember that a very interesting discussion was conducted in *Coal Age* some time since (Vol. 4), when facts were stated by some showing that the continued use of the Davy safety lamp by firebosses tended to develop and increase this disease, although the opinion was advanced by men who had used the lamp continuously for many years that such continuous use had no effect on healthful eyesight.

In my experience it has been found that the introduction of lamps having a greater illuminating power has been followed by a decided reduction in the number of nystagmus cases among men working in the mines. Men in my charge who were affected with this disease or even suspected of developing nystagmus were invariably furnished with an electric lamp. The testimony of these men is unanimous to the effect that they can do better work with greater comfort than with the old light and that on going home they can read the newspaper without its producing headache or affecting the eyes as formerly.

I also believe that where men are furnished with a clean and better light the number of accidents is greatly reduced and the general health of the men improved. It is freely admitted that the first cost of electric mine lamps is comparatively high. Also, where the mine is not equipped with an electrical system, it is necessary to

install a generator or purchase electric current to recharge the lamps. To offset this, however, it may be stated that with proper use and care the lamps do not get out of order.

An important feature that commends the use of the electric lamp is that it does not consume the oxygen, which is the vital element of the atmosphere, and does not smoke or generate gas to vitiate the mine air. Such lamps as have passed the test of the United States Bureau of Mines and are classed as "permissible" can be regarded as safe for work in gaseous or dusty atmospheres. It can also be stated that the electric current necessary to operate these lamps costs less than oil, giving at the same time an excellent light. Wherever they have been installed and given a fair trial, they are held in high esteem for general mine use. It must be admitted that the chief disadvantage of the electric mine lamp is in its inability to reveal the presence of gas in the mine air. I would suggest, however, that this loss can be overcome by competent firebosses making regular examinations of all places in a mine generating gas.

On the other hand, oil lamps, though cheap in respect to first cost, consume much of the oxygen of the air and often smoke owing to the fact that they can be made to burn almost any kind of oil or grease found about the mine. Where such lamps are in use, the air frequently becomes foul with the smoke and gases produced by the lamp. Much fine carbon is deposited on the timbers and the walls of the mine. The open flame of the lamp is dangerous wherever gas is generated or the mine particularly dusty. Numerous fires in mines have been traced to the use of the open light, the flame of the lamp coming in contact with canvas, hay, oil-soaked timbers or dry brattice boards. A discarded smoldering lamp wick thrown into a corner may start a fire in oily waste or other combustible material.

In conclusion, I want to say that when one considers the large number of accidents that have resulted in the loss of precious lives and which have been caused directly by the careless use of an open light, it is clear that we are playing a game of chance in the mines every day that we continue to use such lamps. In the interest of the Safety-First idea, which is being preached and practiced so extensively today, I would urge that it is high time that we recognized this great menace to life and property in the operation of coal mines and deal with it as it deserves.

J. W. POWELL.

Windham, Mont.

Rotary Converter vs. Motor-Generator Set

Letter No. 2—The article on this subject, by T. R. Hay, that appeared in *Coal Age*, May 22, p. 880, has just come to my attention. There are several statements made in this article in reference to design, operating characteristics and the application of the various types of machines that are quite misleading.

The fact that the author limits his discussion to this type of apparatus as applied to coal-mining work would suggest that the size of the units considered, whether rotaries or motor-generator sets, does not exceed a maximum of 400 kw., while the average size of the unit employed would probably be about 150 kw. This limitation of size of unit makes some of the author's statements not

applicable to the conditions he is considering. For instance, booster rotaries are never built in such small sizes, but are used exclusively for central-station work and have a minimum size of about 1000 kw.

What the author says in regard to the application and limitation of the different types of transforming apparatus is also misleading, as it is prejudiced against the rotary converter. A rotary converter or a motor-generator set, of either the synchronous or induction-motor type, has a definite field of application where the best results are obtained. Under conditions that permit the suitable regulation of power supply, and where the arrangement is such that an increase in the direct-current voltage at terminals of machine, due to increase of load, is unnecessary the rotary converter is the best type of machine to employ; but such an application should not be made off-hand without thoroughly understanding all the limiting conditions.

The synchronous motor-generator set is advisable when the power conditions on the supply circuit are good, and where independent regulation for overcompounding of direct-current voltage is necessary; but if the power-supply conditions are bad the induction motor-generator set will give better results. It must be remembered that while the synchronous motor-generator set has the desirable feature of permitting power-factor adjustment, such an adjustment may prove of advantage or otherwise, depending on the conditions. It is seldom of much use at a central station, without suitable control in respect to the use of power by the consumer. The rotary converter has this same feature of power-factor correction, but in a more desirable degree. In this converter the necessary adjustment can be made permanent so that the power-factor correction will vary with the load, thus always giving the best results with varying load.

In regard to the overload capacity of different types of machines, the modern rotary converter, which is equipped with commutating poles, is capable of carrying momentary loads as high as 300 per cent., while the modern direct-current generator is limited to an overload capacity of only 200 per cent. This advantage of the rotary converter is inherent in that type of machine. In mining practice, especially where locomotives are employed, such momentary overloads are frequent, and substation equipment in coal mining is generally selected with this fact in mind, the limit being the commutation of direct-current machines.

Rotary converters are now designed for 60-cycle service, and give much more satisfactory operation than the 25-cycle machine of a decade ago. The starting of a rotary converter is no more complicated than that of a synchronous motor-generator set, the apparatus being practically the same in each case. Synchronizing is now no longer necessary, which eliminates that objection.

In respect to the total cost it may be stated that, with a few minor exceptions, a rotary converter and its transformers will be cheaper than a motor-generator set of either type. It is worthy of note that the cost for power-factor correction is generally of minor importance to the coal operator, while the cost of installation is his first consideration. It is well to remember that, in addition to the cost of the apparatus, there is the expense of building the substation underground and installing the machinery therein. In this connection, there is a particular advantage in the smaller size of a rotary converter and its

switching apparatus, which require less room and a smaller outlay for building the substation.

Where a large direct-current installation is necessary it will be found more economical to have two or more properly located substations with minimum of feeder copper instead of using one substation, requiring an excessive amount of feeder copper and causing large variations in direct-current voltage. With a proper distribution of feeder wires the direct-current voltage will be maintained at a higher average, giving an increased output by the locomotives and costing less for maintenance of auxiliary machinery. In considering a number of substations, the total cost of building, operation and attendance must be taken into account. Substations can often be so located as to combine the attendance of the substation with that of a fan or pump, and thus reduce the expense.

I do not wish to be understood as advocating the general application of rotary converters for coal-mine substations under all conditions. When the conditions are favorable, however, the first cost of the entire equipment and installation will generally be lower, its maintenance no higher, and the overall efficiency much greater than that of motor-generator sets. It may be stated that a more thorough analysis of the engineering features of an installation of rotary converters is necessary than when using synchronous or induction motor-generator sets.

As an illustration, I may cite a company that controls a group of mines in West Virginia and has recently ordered 24 rotary converters, which are to replace former direct-current generating stations, several substations being frequently replaced by a single generating station. In this case, a thorough study was made of all the operating conditions, and the substations were located sometimes on the surface and sometimes underground, with the view to maintaining as nearly constant voltage on the network of trolley lines as possible. To increase the safety of operation the voltage in use was reduced from 500 to 250 volts. But even with this lower pressure the regulation will be better than with the former high-voltage system employed.

W. M. HOEN.

East Pittsburgh, Penn.

■

Preventing Mine Explosions

Letter No. 3—My attention was attracted by the statement of Mine Inspector Rose, *Coal Age*, May 8, page 819, where he asserts, "As long as coal is mined disasters must occur."

It is true that mining accidents and disasters have been regarded in the past as incidental to coal production. Most of the opinions expressed as to the occurrence of mine explosions indicate that in the large majority of cases they are the result of carelessness or inefficiency in the management and operation of the mine. This fact alone should be sufficient evidence that it is possible to remedy this great evil. To my mind the statement of Mr. Rose is dangerous and invites the recurrence of mine disasters, which he predicts are inevitable. It shows, however, that mining men are for the most part indifferent if not wholly apathetic in respect to many live and vital questions in mining, upon the solution of which depend thousands of lives each year.

I am not appealing to sentiment solely, but want to urge that the study of this question is a business proposi-

tion and should be recognized as such by all engaged in the mining of coal. Human lives are too sacred to be sacrificed on the altar of carelessness, ignorance and inefficiency. It may take a number of years to discover an effectual remedy that will wholly avert the occurrence of mine explosions, but this should not prevent the careful consideration and adoption of any palliative measures that will tend to reduce the frequency of mine explosions.

In my opinion, the true solution of this question lies in a higher sense of duty among mining officials and a more thorough and intimate knowledge of the elementary principles of mining by the rank and file of mine operatives. Attention has well been drawn to the great need of the education of mining men and of co-operation on the part of every mine worker and mine official. Instead of asserting that "as long as coal is mined disasters will occur," we might rather say that as long as mines are operated in a careless and inefficient manner disasters are liable to happen at any time.

Permit me to refer to one instance that will show what can be accomplished where care is exercised in the operation of the mine. Some may regard it as a result of luck or because of particularly favorable conditions in the mine workings, but I consider it is owing entirely to the great care and precaution that have been exercised in this operation. The mine to which I refer employs 800

men underground, and during the past two years there has not occurred a single fatal accident at the working face. Only a complete system of organization can effect such results. Such a record shows that the mine management has made a determined, intelligent and successful effort to render the mine as safe and the operations as efficient as is humanly possible.

In closing, I want to suggest a few points, the observance of which will greatly reduce if not entirely eliminate mine accidents. They are as follows:

1. Employ none but thoroughly trained and competent mine officials to take charge of operations underground.
2. Let all mine officials meet regularly, say once a month, to compare notes, exchange opinions and discuss plans for greater co-operation in their work.
3. Provide for a closer, more frequent and thorough inspection of all mining work.
4. Provide ample opportunities for the education and training of miners, by which they may become thoroughly familiar with the principles involved in their work. I believe that what man has done, man can do, and as accidents have been reduced to a minimum by the exercise of greater care and precaution in one mine, it is possible to do the same in other mines.

WILLIAM CROOKS.

Ensley, Ala.

Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

VOLUME OF AIR AND GASES

The volume of any given weight of air or gas depends on two factors—the temperature of the gas and the pressure it supports.

Effect of Temperature—For any given weight of air or gas, its volume varies directly as its absolute temperature, assuming the pressure remains constant.

Effect of Pressure—For any given weight of air or gas, its volume varies inversely as the pressure it supports, assuming the temperature remains constant.

Expansion and Contraction of Air or Gases—Any change in temperature or pressure causes a corresponding change in the volume of the air or gas, as follows:

Increase of temperature causes expansion.

Decrease of temperature causes contraction.

Increase of pressure causes contraction.

Decrease of pressure causes expansion.

Coefficient of Expansion or Contraction—The coefficient of expansion is the same as that of contraction. This coefficient is practically the same for all gases and air and is independent of the pressure.

The coefficient of expansion of air or gas is the ratio of the increase in volume to the original volume, for an increase of one degree in temperature. Since a degree of the Fahrenheit scale is $5/9$ of a degree of the centigrade scale, it is evident that the Fahrenheit coefficient of expansion will be exactly $5/9$ of the centigrade coefficient. These coefficients are as follows: Centigrade, 0.003663; Fahrenheit, 0.002035.

Illustration—Let it be required to find the increase in volume in an air current of 100,000 cu.ft. entering a mine at a temperature of 32 deg. F. and discharged at a temperature of 68 deg. F.

Solution—The rise in temperature is $68 - 32 = 36$ deg. F. The increase in volume, calculated by the Fahrenheit scale, is $100,000 \times 0.002035 \times 36 = 7326$ cu.ft.

Or, since 68 and 32 deg. F. correspond to 20 and 0 deg. C., the rise in temperature is $20 - 0 = 20$ deg. C., and the increase in volume, calculated by the centigrade scale, is $100,000 \times 0.003663 \times 20 = 7326$ cu.ft.

Note—Instead of multiplying by these coefficients, it is possible to divide by their reciprocals, which are

$$\text{Fahrenheit, } \frac{1}{0.002035} = 491.4, \text{ say } 492$$

$$\text{Centigrade, } \frac{1}{0.003663} = 273$$

These numbers, being divisors, show that air or gas expands or contracts $1/273$ of its volume, for each degree rise or fall in temperature (centigrade); or $1/492$ of the same volume for each degree rise or fall in temperature (Fahrenheit). The figures point to what has been called the "absolute zero" of temperature scales as being 273 deg. below freezing (centigrade) or 492 deg. below freezing (Fahrenheit).

The Coal Age Pocket Book

Absolute Zero—The so-called "absolute zero" of temperature scales is based on the observed rate of expansion and contraction of all gases and air. This rate is practically $1/273$ of the volume, per degree centigrade; or $1/492$ of the volume, per degree Fahrenheit. It is clear that if this rate

continued unchanged a fall in temperature of 273 deg. C., or 492 deg. F., below the freezing point of water, would reduce the volume of the gas to zero, when all molecular vibrations would cease, indicating a total absence of heat and pressure.

The absolute zero has therefore been fixed at 273 deg. below the common zero of the centigrade scale (-273° C.), which corresponds to 460 deg. below zero on the Fahrenheit scale. The fixing of this point is purely arbitrary, its chief value being the facility it affords in the calculation of gaseous volumes with respect to temperature.

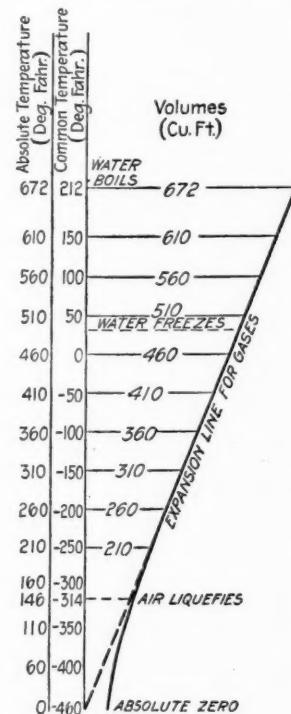
Absolute Temperature—Absolute temperatures differ from common temperatures only in being estimated from the absolute zero. Hence the absolute temperature is obtained from the common temperature by adding 273 in the centigrade or 460 in the Fahrenheit scale; thus,

$$30 \text{ deg. C.} = 273 + 30 = 303 \text{ deg. absolute.}$$

$$60 \text{ deg. F.} = 460 + 60 = 520 \text{ deg. absolute.}$$

Relation of Volume and Absolute Temperature of Air and Gas—The law commonly known as **Gay Lussac's or Charles' law** makes the volume of all gases and air, under constant pressure, vary directly as the absolute temperature.

This relation is clearly illustrated in the accompanying figure, which assumes a volume of 460 cu.ft. of air or gas at 0 deg. F., corresponding to the absolute temperature at that point. It will be observed that this volume expands and contracts exactly as the absolute temperature rises or falls, except at the lowest temperatures approaching the liquefaction of the air or gas where the law naturally fails, owing to the changing state of the matter.



temperature at that point. It will be observed that this volume expands and contracts exactly as the absolute temperature rises or falls, except at the lowest temperatures approaching the liquefaction of the air or gas where the law naturally fails, owing to the changing state of the matter.

Inquiries of General Interest

Pennsylvania Mine Law Amended

There has been much discussion recently in regard to the amendment of the Pennsylvania mining law relating to the need of certification of mine foremen and other mine officials. It is claimed that this amendment so modified the present bituminous law that coal companies are now permitted to hire persons to act as mine foremen, assistant mine foremen or firebosses who have not passed a state examination and do not hold a certificate of competency, as was heretofore required by law.

Will you kindly explain this amendment, stating its effect and purpose?

INQUIRER.

—, Penn.

The law to which correspondent refers is an act amending art. 4, sec. 1; art. 5, sec. 1, and art. 24, sec. 9, of the bituminous mine law of Pennsylvania. This amendment passed by the last legislature was approved by Governor Brumbaugh, June 1, 1915.

The action taken by the legislature came as the result of the difficulty arising in the adoption of the new Workman's Compensation Act in the state. This act imposes on all operators working under its provisions a liability for death by accident or for injury sustained by workmen while performing their duties in and about the mine. There has always been some contention as to how far the authority of the company extended over the actions of the mine foremen and firebosses in their employ. The reading of the bituminous mine law (1911) gave the foreman "full charge of all the inside workings and of the persons employed therein." The law also gave the fireboss virtual control over the operation of the mine, in respect to dangers arising from the accumulation of gas.

In connection with the new compensation law, it has been objected by the operators that if they were to be held liable for accident to mine workers, they must be permitted to employ mine foremen, assistant mine foremen and firebosses who in their judgment are capable of performing the duties imposed on them by law and of operating the mine safely and economically.

The following extracts from those sections of the law to which reference has been made will show the changes made in the wording of the law and the additions thereto. Where the words have been omitted or changed, this will be indicated in a footnote giving the original wording of the law. Additions made to the reading of the old law are marked by parentheses. It will not be necessary to repeat the entire sections of the law, but a series of dots, or ellipses, will show where portions are omitted which are identical with the old law. The amended sections are the following:

Art. 4, sec. 1. In order to secure efficient management and proper ventilation of the mine . . . the operator or the superintendent shall employ a competent and practical mine foreman . . . (who shall be under the supervision and control of the operator). The mine foreman shall have full

charge of all the inside workings and the persons employed therein, (subject, however, to the supervision and control of the operator), in order, etc. . . . If the mine is generating explosive gas . . . the mine foreman must possess a first-grade mine-foreman's certificate, (or be a person who, in the judgment of the operator, is a person equally competent with the holders of such certificates). If the mine is nongaseous the mine foreman must possess either a first-grade mine foreman's certificate, or a second-grade mine foreman's certificate, (or be a person who, in the judgment of the operator, is fully competent with the holders of such certificates).

When the mine workings become so extensive that the mine foreman is unable, etc. . . . he shall have the right to employ a sufficient number of competent persons to act as his assistants, who shall be under his instructions (and the operator's instructions) in carrying out the provisions of this act. If the mine is generating explosive gas . . . the mine foreman's assistants must possess first-grade assistant mine foremen's certificates, (or be persons who, in the judgment of the operator, are equally competent with the holders of such certificates).

In case of the necessary temporary absence of the mine foreman, he may deputize . . . his assistant, who shall perform all the duties of the mine foreman; (and have the right to hire and discharge employees; the management of the mine and the direction of the working forces are vested exclusively in the operator; and no person or persons, association or associations, organization or organizations, corporation or corporations, shall interfere with or attempt to interfere with, abridge or attempt to abridge, in any manner whatsoever, such right; provided, that this act shall not invalidate any existing contract).

Art. 5, sec. 1. In such portions of a mine wherein explosive gas has been generated . . . the mine foreman shall employ a fireboss or firebosses, whose competency to act as such shall be evidenced by a certificate of qualification from the Department of Mines on the recommendation of the examining board, as provided for in sec. 6, art. 24 of this act; (or a person or persons who, in the judgment of the operator, is equally competent with the holders of such certificates). It shall be the duty of the fireboss to examine carefully, etc. . . . The examination shall begin within three hours prior to the appointed time¹ to enter the mine. The fireboss shall examine for danger, etc. [No further change in this section.]

Art. 24, sec. 9. It shall be lawful² for any operator, manager or superintendent to employ as mine foreman in any mine, or as assistant mine foreman in any gaseous mine, any person who has obtained the proper certificate of qualification or service required by this act, (or any person who, in the judgment of the operator, is equally competent with the person or persons who are the holders of such certificates); provided, that all persons holding certificates etc. . . . and it shall be unlawful for any operator, manager, superintendent or mine foreman to employ as fireboss any person who has not obtained the proper certificate of qualification required by this act, (or a person who, in the judgment of the operator, is equally competent with the person or persons who are the holders of such certificates); provided, that all persons holding certificates, etc. [No further change in this section.]

This act shall not go into force or become operative until the first day of January, A. D. 1916.

All acts or parts of acts inconsistent with this act are hereby repealed.

The changes made in the reading of the bituminous law (1911) are not as drastic as may at first appear. On sober, second thought they are only such as are reasonable when considered in connection with the obligations imposed on the operator of a mine by the provisions of the Workmen's Compensation Act of 1915.

¹The words "for each shift," in the old law, have been dropped from the amendment.

²The old law reads "unlawful."

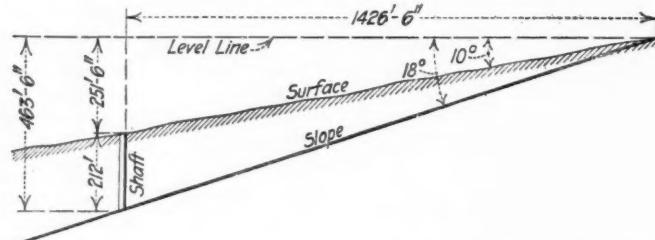
Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—A seam of coal 8 ft. thick crops out at the north line of a tract of land. The seam dips 18 deg. south, while the surface has a regular dip of 10 deg. in the same direction. How far south of the north line must you go to sink a shaft so that it will cut the seam at a point 1500 ft. measured on the pitch of the seam, and what will be the depth of the shaft from the surface to the bottom of the slope?

Ans.—Since the seam has a regular dip of 18 deg., the horizontal distance, corresponding to a distance of 1500 ft. measured on the pitch of the seam, is $1500 \times \cos 18 \text{ deg.} = 1500 \times 0.951 = 1426.5 \text{ ft.}$, as shown in the accompanying figure. The elevation of the surface



at this distance from the crop line for a regular dip of 10 deg. in the same direction is $1426.5 \times \tan 10 \text{ deg.} = 1426.5 \times 0.1763 = 251.5$, as indicated in the figure. The corresponding elevation of the foot of the slope or bottom of the shaft can now be found in two ways:

$$1500 \times \sin 18 \text{ deg.} = 1500 \times 0.3090 = 463.5 \text{ ft.}$$

$$1426.5 \times \tan 18 \text{ deg.} = 1426.5 \times 0.3249 = 463.5 \text{ ft.}$$

The elevation of the surface at the shaft, and that of the shaft bottom, as thus found, are the respective vertical distances of these points below the crop line at the surface. The depth of the shaft is found by subtracting the surface elevation from that of the bottom of the shaft. Thus $463.5 - 251.5 = 212 \text{ ft.}$

Ques.—If a pump will lift water 34 ft. at sea level, with a barometer reading of 30 in., how high will it lift water at an altitude of 5400 ft.?

Ans.—This is not a fair question to ask candidates in examination, unless they are permitted the use of textbooks or are given the corresponding barometer reading at an elevation of 5400 ft. above sea level. The barometer reading for this elevation, under normal atmospheric conditions, as taken from tables, is 24.5 in. The draft of the pump, as given for sea level (34 ft.) is the theoretical suction or lift. The corresponding lift at an altitude of 5400 ft., assuming a barometer reading of 24.5 in., is

$$\frac{24.5}{30} \times 34 = 27.6 \text{ ft.}$$

In practice a common rule for determining the suction or lift of a pump is to estimate the lift in feet as nine-tenths of the barometer reading in inches, or in this case: At sea level, $0.9 \times 30 = 27 \text{ ft.}$; at an altitude of 5400 ft., $0.9 \times 24.5 = 22 \text{ ft.}$

Ques.—The grade of an incline is 7 per cent.; the length of the incline is 2000 ft.; the weight of the rope 4000 lb.; the weight of the full car 1800 lb. How many cars must there be in a trip to make this plane self-acting?

Ans.—The force acting to produce motion on a self-acting incline is the unbalanced weight of the coal in the loaded cars, the weight of the cars themselves being balanced on the two sides of the incline. The forces resisting motion are the unbalanced weight of the rope when the empty trip is at the bottom of the incline and the friction pull of the entire moving load, which includes the weight of the loaded and empty cars and that of the rope.

The question does not state the weight of the empty car, which must therefore be assumed as, say 600 lb. This makes the weight of coal carried in each car 1800 - 600 = 1200 lb. Calling the number of cars on each side of the incline n , the weight of coal in a single trip is $1200n$, and the corresponding gravity pull producing motion on a 7 per cent. grade, is, therefore, $1200n \times 0.07 = 84n$ lb.

The gravity pull of the rope, which resists motion, is $4000 \times 0.07 = 280$ lb. Taking the weight of a loaded car as 1800 lb. and that of an empty car as 600 lb., the total weight of one loaded and one empty car is $1800 + 600 = 2400$ lb., and the total moving load on the incline, including that of the rope, is $2400n + 4000$. The friction pull may then be assumed as $\frac{1}{40}$ of the load, which gives

$$\frac{4000 + 2400n}{40} = 100 + 60n.$$

Then, equating the gravity pull of the coal with the gravity pull of the rope and the friction pull of the entire moving load, gives

$$\begin{aligned} 84n &= 100 + 60n + 280 \\ 24n &= 380 \\ n &= \frac{380}{24} = \text{say } 16 \text{ cars.} \end{aligned}$$

Under the assumed conditions, therefore, there are 16 loaded and 16 empty cars, making a total of 32 cars on the incline.

Ques.—What units of work are necessary to overcome the friction of an airway 6 ft. square, 1000 ft. long, when the quantity of air passing is 10,800 cu.ft. per min.?

Ans.—The perimeter of this airway is $4 \times 6 = 24$ ft., and its rubbing surface $24 \times 1000 = 24,000 \text{ sq.ft.}$; its sectional area is $6 \times 6 = 36 \text{ sq.ft.}$ The velocity of the air current in this case is $10,800 \div 36 = 300 \text{ ft. per min.}$ The pressure required for the circulation is, therefore,

$$p = \frac{0.00000001 \times 24,000 \times 300^2}{36} = 0.6 \text{ lb. per sq.ft.}$$

The corresponding units of work are, therefore,

$$u = 10,800 \times 0.6 = 6480 \text{ ft.-lb. per min.}$$

Coal and Coke News

Washington, D. C.

The Federal Reserve Board has issued a new regulation relating to discountable paper which is already receiving widespread attention in all branches of business and is likely to be particularly useful in the financing of the coal industry, as business customs already existing there seem to be such as will permit the successful use of the trade acceptances without too serious obstacles.

In the new circular and regulation, provision is simply made for the direct rediscounting by Federal Reserve banks of paper drawn against sales of goods and accepted by purchasers. Such accepted bills are made eligible for discount or purchase by a Federal Reserve bank provided they bear the endorsement of a member bank. In issuing the new regulation, the board announces that it does so in the belief that the new policy will lead to the broadening of the use of two-name commercial paper by the country at large.

The trade acceptance is defined as a bill of exchange drawn to order, leaving a definite maturity and payable in dollars in the United States, the obligation to pay it having been accepted by an acknowledgement written or stamped and signed across the face of the instrument by the company, firm, corporation or person upon whom it is drawn; such agreement to be to the effect that the acceptor will pay at maturity according to its tenor such draft or bill without qualifying conditions.

A trade acceptance, to be eligible for rediscount under section 13 of the Federal Reserve Act, with a Federal Reserve Bank at the rate to be established for such acceptances must be endorsed by a bank which is a member of the Federal Reserve system, must have a maturity at the time of rediscount of not more than 90 days, and must be accepted by the purchaser of the goods who must certify that the indebtedness represented by the bill was expressly incurred in the purchase of goods.

The trade acceptance must bear on its face or be accompanied by, evidence in form satisfactory to the Federal Reserve Bank that it was drawn by the seller of goods on the purchaser of such goods. The evidence in question may consist of a certificate accompanying the acceptance in question to the effect that the obligation of the acceptor of the bill arises out of the purchase of goods from the drawer.

The new regulation, thus framed, is intended to afford more direct facilities to business men in obtaining credit through rediscount than are now available and will bring them into closer communication with the reserve banks.

PENNSYLVANIA

Anthracite

Hauto—In order to conserve a supply of water to keep the mines running during dry spells, which seem to come with great regularity during the past several years, the Lehigh Navigation Electric Co. has built an immense reservoir at a cost of \$500,000. It has now been discovered that the reservoir has a leak so extensive that it is estimated it will entail an expenditure of \$50,000 to render the storage plant entirely serviceable.

Centralia—While engaged in stripping operations over an old breast of the Lehigh Valley Coal Co., the ground caved in and four men employed by a contracting firm, were carried down into the mine. They all escaped serious injury except Michael Hauscheck, who being caught beneath a mass of earth was smothered to death. His body was recovered several hours after the accident.

Girardville—Packer No. 5 colliery of the Lehigh Valley Coal Co. is shut down because the 600 employees have gone on a strike. Two men were discharged for disobedience of orders and the other workmen then threw down their tools.

Shenandoah—A series of accidents occurred in the mines here in one day recently in which 8 men were badly injured. The most seriously hurt was Charles Rotomosky. It is feared that he has been blinded for life.

Pottsville—W. R. McTurk & Co. recently sold all of the outside equipment, including buildings, at the Tomhicken mines, as it has been determined that the operation can no longer be profitably worked.

Tamaqua—Caught in an explosion in the No. 4 mine of the Lehigh Coal & Navigation Co. recently four men were so badly burned that they were removed to the Coaldale Hospital. Four others were severely burned, but had their injuries treated in their homes.

All the collieries of the Lehigh Coal & Navigation Co. in the Panther Creek Valley began operation in full on July 12, after a ten day lay-off. It is also reported that the business in sight is sufficient to warrant good working time for the remainder of the summer.

Bituminous

McClellandtown—The Puritan plant of the Puritan Coke Co. is making preparations to resume in full. The 84 idle ovens at the plant are to be fired. There are at this time 118 ovens in operation. The monthly production of the company is some 12,000 tons.

Gates—Orders have been issued by the Frick company to its officers at Gates, which has been idle for months, to prepare to resume in full forthwith. The output will be shipped direct to the Pittsburgh district. Superintendent Harry N. Boyd, of Lambert plant is to have charge of the operations at Gates.

Uniontown—Two hundred additional coke ovens have been ordered fired at the Frick plants contiguous to Uniontown. The list of plants affected includes Colonial No. 1. Continental No. 3; Edenborn; Hecla No. 3; Leisenring Nos. 1, 2 and 3; United; York Run, Hostetter and Whitney.

Five small coke plants near Brownsville have been ordered into full operation. The plants are: Garwood mines of the Etna Connellsburg Co. at Simpson, shut down for over a year; Champion mines of the Connellsburg Consolidated, near Brownsville; Grays Landing Connellsburg Consolidated Nos. 1 and 2; Kathering works, Union Connellsburg, at Simpson. At the five plants there will be something like 800 hitherto idle ovens fired. All the plants are owned by independent producers.

Pittsburgh—The properties of the Pittsburgh-Buffalo Co. were sold at public auction at Pittsburgh on July 15 to the Union Trust Co. of that city for \$1,500,000, the only bid made. The sale was subject to a lien of a first mortgage made in 1909 to secure a bond issue of \$2,500,000 of which bonds to the par value of \$1,769,000 were issued and upon which there has been no interest paid since Aug. 2, 1913. The sale represents an outlay of nearly \$3,500,000. The properties were exposed for sale in the rotunda of the Allegheny County court house under the direction of Attorney George H. Calvert the master named by the court. The holdings disposed of consist of the Marianna mine, the Francis mine, the Johnetta Mine, the Bertha mine and the Higbee tract. The first named is the largest containing about 5328 acres of coal. The mines are equipped with steel tipplers and modern equipment. Included in the plant are 700 acres of surface upon which are erected the power plants, ovens, and houses of which 235 are built of brick. The properties were first offered for sale separately but there were no bids, after which they were offered in a lump. Attorney James H. Beal after the sale opened made the only bid of \$1,500,000 as the representative of the Union Trust Co. There being no other bidders his offer was accepted. The Union Trust Co. holds the first mortgage on the property.

Brownsville—After a suspension of a year and a half the Garwood plant of the Etna Connellsburg Coke Co. has resumed operations in full. There are 119 ovens at this plant and Superintendent C. L. Patterson is having a hard time in recruiting sufficient labor with which to fully man the plant.

Ferndale—Miners employed by the Smokeless Coal Co., in whose workings an explosion occurred May 24, have been equipped with electric lamps. These lamps, however, have been supplied the miners only in those sections where there is supposed to be gas.

WEST VIRGINIA

Charleston—All the coal mines operated on Kelley's Creek by the Sunday Creek Co. were recently closed, and will not resume operations before fall, if even then. Over 300 miners living at Cedar Grove have been thrown out of employment, while store clerks, teamsters and others are in-

cluded among the number losing work. It is rumored that the Monarch Mine will also suspend operations for the summer.

ALABAMA

Birmingham—James L. Davidson, secretary of the Coal Operators Association is in Montgomery in the interest of pending legislation of interest to the operators. The two-weeks pay-day bill and the commissary check bill are measures before the body that are opposed by the coal operators. The Recess Investigating Committee has just made its recommendations, which urge, that the convicts be removed from the lease system and that they be taken from the coal mines and worked on the roads.

Edgewater—The Edgewater mines of the Tennessee Coal & Iron Co. are now working six days a week after being on short time for several months. The capacity of the mine is 2500 tons a day. About 300 people attended the annual outing and institute of the Alabama Coal Operators' Association at Edgewater. Lectures on scientific subjects dealing with mining and mine welfare work was a feature of the program. A demonstration was made of a dust explosion by black powder and the results from use of permissible explosives. Special papers on interesting subjects were read by experts.

KENTUCKY

Fleming—The Elkhorn Mining Corporation plant is now running full time in order to fill the large orders received within the past two weeks. It is expected that a record run will be made the remainder of the year.

Jenkins—The Consolidation Coal Co.'s plants here and at McRoberts are operating full time in their efforts to fill the big orders for their product received lately. More coal is now being shipped from the field around Jenkins than at any time in its history. Railroads are taxed to handle the tonnage.

OHIO

Bridgeport—The Loraine Coal & Dock Co. has decided to board up one of its largest mines until April of next year. This mine employed about 450 men when working to its full capacity. The Loraine Coal & Dock Co. is operating several other mines, but it is said the continuity of operation is precarious.

Pipe Creek—The Johnson Mine began work July 16, after being idle since April of 1914. For some time prior to the opening of this mine, men have been employed in getting things in proper condition to begin operations.

Steubenville—Fire almost totally destroyed the buildings of the Strabley Coal Co.'s mine recently, entailing a loss of approximately \$10,000. The power house and the equipment contained therein and a part of the coal tipple were consumed. This mine employs about 70 men, who will be thrown out of work until the necessary buildings can be erected and repairs made.

Columbus—During the past week the Ohio public utilities commission has been securing information from local coal companies relative to alleged discrimination against Ohio in favor of West Virginia in the matter of coal rates. The decision of the Ohio Supreme Court, handed down recently, which confirms the right of the commission to adjust freight rates, is expected to bring about numerous requests for regulation from the coal shippers of the state. The Sunday Creek Co. declares that the complete suspension of its mines in Ohio for some time to come depends to a great extent upon the action of the commission. Unless the railroads decide to carry the question into the federal courts, the reduction of rate on commercial coal from the Nelsonville assembling yards in the Hocking Valley to Toledo, from \$1 to 85c, will go into effect in the near future.

Nelsonville—A local strike which caused the closing down of two mines of the New York Coal Co. has been settled after a week's suspension. These mines are connected with the only active coal washery in the Hocking Valley, and the trouble was over the matter of hours for day labor.

Tropic—Making the assertion that the present mining scale, together with the Green mine run law has destroyed the coal industry in Ohio, the operators of the Tropic mine, have issued a circular showing that the payroll of the mine for June, 1915, was \$457.05, as compared with \$19,642.55 in 1913. As there was a general suspension in Ohio in the same month of 1914, that year offers no basis of comparison.

New Lexington—The collapse of the tipple at No. 1 San Toy mine a few days ago, shortly after the men had resumed work after a year's idleness, will necessitate further idleness until the damage can be repaired. This will take about a month.

Athens—Suit has been filed by Edgar Stark, as trustee under certain mortgages and deeds of trust executed by the Luhrig Coal Co., against that company for a receivership to take charge of the company's property pending the adjustment of claims based upon outstanding obligations. Leander D. Oliver, of Cincinnati, has been appointed receiver.

COLORADO

Denver—State coal mine inspector James Dalrymple, recently, revoked the certificate issued to Lindsey Connor, shot-firer in the Delagua mine of the Victor-American Fuel Co. after repeated warnings that his carelessness in firing was endangering the lives of miners. Dalrymple is striving to reduce the high mortality in Colorado coal mines which, in 1913, was 8.6 per 1000, and in 1914, was 7.0 per 1000. He states that conditions in Boulder and Weld counties especially have greatly improved.

PERSONALS

A. B. Lamb, state mine inspector, will be transferred from the 13th district at Shenandoah, to the 18th, with offices in Pottsville.

John Green, of Belleville, Ill., 74 years old, has passed an examination as coal mine examiner or fireboss. He is the oldest man who has ever taken the examination in Illinois. Green was formerly a member of the Legislature.

William T. Dunn, formerly tool-steel expert for the Carpenter Steel Co. in Boston and New England, has been appointed by the International High Speed Steel Co. of New York, district sales agent for New England and eastern Canada.

George L. Walkenshaw has resigned as superintendent of the Eastern Kentucky Coal Co.'s mines at Torchlight, Ky., and has been succeeded by R. C. Simpson. Grover Sea also has resigned as mine foreman and has been succeeded by A. B. Walkenshaw.

W. S. Robertson was appointed secretary of the American Locomotive Co. at a meeting of the board of directors recently held. This appointment fills the vacancy caused by the resignation of T. B. Denny, which was accepted at the same meeting.

I. W. Copelin, who for years was active in the coal trade of Toledo but who retired a couple of years ago, has brought suit against the Pennsylvania R.R. Co. for damages amounting to \$10,000 which Mr. Copelin alleges he suffered during a collision at Woodville, just outside the city of Toledo a couple of years ago.

William Hamilton, 29 years of age, was buried for 45 min. under a fall of roof in Mine No. 2 of the Union Mining Co. on July 14. Hamilton was completely covered and the rescuing party were amazed when they reached him to find that he was not seriously hurt, his worst injury being a broken arm. Twelve carloads of soft roof coal were removed before the man was reached.

Ralph T. Coe, manager of the Canadian Sirocco Co. Ltd., Windsor, Ont., since the organization of the company, has resigned to enter the engineering service and sales field in New York State. Mr. Coe has been appointed district manager for Warren, Webster & Co. and the American Blower Co. and will have offices at 519 Insurance Bldg., Rochester, and 19 Live Stock Exchange Bldg., Buffalo, N. Y.

Stewart K. Smith, a mining engineer of St. Louis, has been appointed receiver of the Consolidated Indiana Coal Co., a corporation of the State of Maine, owning over 10,000 acres of coal rights and surface in Sullivan County, Indiana, with four operating mines; 6500 acres of undeveloped coal lands in Franklin County, Illinois, and 4500 acres of coal rights and surface in Marion and Lucas Counties, Iowa, with one operating mine. The receivership took effect on July 14.

White L. Moss, who has been vice-president and general manager of the Continental Coal Corporation, which owns the mines on Straight Creek, Ky., has resigned and Max Barker, of Louisville, chairman of the executive committee, has taken charge until the directors make permanent arrangements. The miners are still out on their demand for a 10 per cent. increase. In the same county the New Jellico Co. has given its men the 10 per cent. increase demanded. There are 600 miners still on strike in the county however.

Governor Dunne, of Illinois has appointed the following delegates to the 18th annual session of the American Mining Congress, to be held in San Francisco Sept. 20, 21 and 22: Frank Farrington, Springfield; J. H. Walker, Springfield; T. J. Reynolds, Collinsville; J. W. Starks, Georgetown; T. H.

Devlin, Assumption; W. T. Morris, Duquoin; James Lord, Farmington; J. F. Morris, Springfield; R. J. Wilson, Marissa; John Tuttle, Harrisburg; Walter Nesbit, Belleville; Thomas Clayton, Royalton; Thomas Kane, Harrisburg; Michael Fahy, Toluca; John F. Demlow, Danville; Barney Murphy, Pana; Joseph Pope, Belleville; Paul Smith, Marion; James Kellett, Gillespie; James Tyler, St. David; T. L. Jones, Ladd; David Ross, Springfield; John Bolander, Pekin; James Forester, Duquoin; Thomas Jeremiah, Willisville; Rice Miller, Hillsboro; A. J. Moorshead, East St. Louis; J. P. Reese, Gillespie; H. H. Devereaux, Springfield; Joseph Randall, Belleville; Julius G. Scott, Bloomington; Hugh Murray, Mt. Vernon; C. F. Lynch, Danville; Frank Peabody, T. J. O'Gara, Glen W. Traer, C. M. Moderwell, C. Robert Silsberg, C. W. Wardley and W. C. Niblank, all of Chicago.

OBITUARY

Robert Childs Scott, secretary and treasurer of the Morris Machine Works of Baldwinsville, N. Y., died recently.

The body of Capt. Bradey Williams, of Covington, Ky., pilot of the Monongahela River Consolidated Coal & Coke Co., steamer "Fulton," who was lost with the boat during a recent hurricane, has been recovered.

Adam S. Boyd, 55 years of age, division superintendent of the Philadelphia & Reading Coal & Iron Co., and in charge of the Shenandoah, Gilberton, Girardville and Ashland districts, and residing in Ashland, dropped dead on the evening of July 18 from heart failure after making an automobile trip from Ashland to Shenandoah. Mr. Boyd had risen from the ranks and at the time of his death was one of the best-known and most trusted coal men throughout his vicinity.

Frank A. Hill, president of Madeira, Hill & Co., extensive coal operators with general offices in Philadelphia, died in Pottsville, Penn., on the 13th inst. Mr. Hill, who was 56 years old, died of agina pectoris, superinduced by acute indigestion. He was an engineer of note, having begun his professional career with the Philadelphia & Reading Coal & Iron Co. Some time afterward he took charge of extensive bituminous properties in Virginia, returning to Pottsville in 1907, entering the firm of Madeira, Hill & Co. The work executed by him at Stanton colliery stands as a type of the highest grade of engineering skill in the anthracite region. In addition to having been a member of the Anthracite Geological Survey, he also took a prominent part in the affairs of the American Institute of Mining Engineers.

TRADE CATALOGS

The William M. Gokey Shoe Co., Jamestown, N. Y. Catalog No. 39. Illustrated, 36 pp., 4x9 in.

The Ensign-Bickford Co., Simsbury, Conn. "Deep Well Blasting." Illustrated, 48 pp., 6x9 in.

The Keystone Blue Paper Co., Philadelphia, Penn. "Samples of Blue Process Paper." Illustrated, 18 pp., 3 1/2x8 in.

The William M. Gokey Shoe Co., Jamestown, N. Y. "Gokey Golf and Athletic Catalog No. 38." Illustrated, 24 pp., 3 3/4x7 in.

The Mesta Machine Co., Pittsburgh, Penn. "Horsepower Charts for Power Transmission Machinery." Illustrated, 4 pp., 6x9 in.

The Howells Mining Drill Co., Plymouth, Penn. Supplement 21,015. Catalog No. 28. "The Spry 'C' Post Drill." Illustrated, 4 pp., 6x9 in.

The Howells Mining Drill Co., Plymouth, Penn. "Howell Noncorrosive Mining Engineer's and Surveyor's Spads." Illustrated, 8 pp., 3 3/4x6 in.

Manzel Bros. Co., 315-319 Babcock St., Buffalo, N. Y. "The Manzel Sight Feed Oil Pump for Cylinder Lubrication. Class H-A." Sixteen pages, 3 1/2x6 1/4 in., illustrated.

PUBLICATIONS RECEIVED

The Mining Law of the State of West Virginia, compiled by Earl A. Henry. Unillustrated, 62 pp., 3 1/2x6 1/4 in.

Department of the Interior, U. S. Geological Survey. "Fuel Briquetting in 1914," by Edward W. Parker. Unillustrated, 3 pp., 6x9 in.

Board of Directors of City Trusts of the City of Philadelphia. "Forty-fifth Annual Report, for 1914." Unillustrated, 338 pp., 6x9 in.

State of Washington. "Report of the State Inspector of Coal Mines, Biennial Period Ending Dec. 31, 1914." Illustrated, 117 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Mica in 1914," by Douglas B. Sterrett. Unillustrated, 10 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Recovery of Secondary Metals in 1914," by J. P. Dunlop. Unillustrated, 5 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Chromic Iron Ore in 1914," by J. S. Diller. Unillustrated, 15 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Phosphate Rock in 1914," by W. C. Phalen. Unillustrated, 14 pp., 6x9 in.

Department of the Interior, Bureau of Mines. "Permissible Explosives Tested Prior to Mar. 1, 1915," by Spencer P. Howell. Unillustrated, 16 pp., 6x9 in.

Canada Department of Mines. Memoir 53. "Coal Fields of Manitoba, Saskatchewan, Alberta and Eastern British Columbia," by D. B. Dowling. Illustrated, 142 pp., 6 1/2x10 in.

Industrial Commission of Ohio, Department of Investigation and Statistics, Report No. 4. "Industrial Accidents in Ohio, Jan. 1 to June 30, 1914." Illustrated, 324 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Barytes in 1914, with a note on Strontium Ore and Salts," by James M. Hill. Unillustrated, 5 pp., 6x9 in.

Department of the Interior, Bureau of Mines. "Monthly Statement of Coal Mine Fatalities in the United States, April, 1915," compiled by Albert H. Fay. Unillustrated, 12 pp., 6x9 in.

Department of the Interior. U. S. Geological Survey, Bulletin 581. "Contributions to Economic Geology, 1913. Part II, Mineral Fuels," by Marius R. Campbell and David White. Illustrated, 187 pp., 6x9 in.

INDUSTRIAL NEWS

St. Louis, Mo.—Joseph P. Ryerson & Son, of Chicago, Ill., is making a considerable addition to the firm's St. Louis plant.

Pittsburgh, Penn.—It is reported that ore, coal, coke and miscellaneous industrial traffic is showing increases over the lines of the Pittsburgh & Lake Erie road to and from Lake ports.

Gary, Ind.—The American Sheet & Tin Plate Co. mills began operating to capacity on July 12. Fires were lighted in the remaining 70 coke ovens, and 10,000 tons of coal per day will be made into coke and the byproducts thereof.

Philadelphia, Penn.—Laden with coal, the power barge "Princess," bound from Baltimore to Pedrickton, N. J., sank recently in Oldman's Creek. The barge was later pumped out and floated and her cargo of bituminous coal salvaged.

Philadelphia, Penn.—Financial institutions of this city interested in the securities of the Continental Coal Co. have been placed on a committee for the protection of the holders of the first mortgage 5 per cent sinking fund bonds of the company.

Central City, Ky.—Coal traffic out of this section over both the Louisville & Nashville and the Louisville, Henderson & St. Louis is increasing and not a day passes when extra trains are not being made up. It is the belief in this section, though not confined by authoritative statements, that the coal is for the export trade.

St. Louis, Mo.—In a suit brought by the Big Muddy Coal & Iron Co. against the City of St. Louis and several individuals, to settle the question of title to a block of valuable land in Carondelet, pending in Judge Taylor's division of the Circuit Court, an order has been granted for the taking of depositions in Kentucky.

Moundsville, W. Va.—The James H. Leighty tract of coal land in Cameron and Webster districts was sold in front of the courthouse door by Auctioneer S. N. Cunningham, acting for Attorney Walter A. McGlughy, as trustee, recently for \$18,000. This price is about \$30 per acre. The purchasers were Messrs. Chaplin, Goldberg and Honecker.

Williamsburg, Ky.—Leading coal dealers from Ohio and Michigan formed a party which recently visited the operations of the Gatlift Coal Co. and the Mahan Jellico Co. at Gatlift and Packard, Ky., mines controlled by the Southern Coal & Coke Co., of Knoxville. E. C. Mahan, head of the Southern company's sales department, was host to the party.

Harrisburgh, Penn.—Arrangements were made recently by Auditor-General Powell and representatives of the Philadelphia & Reading Coal & Iron Co., and other anthracite producers for the filing of the monthly reports of production under the new state hard-coal tax. For the present a few days allowance will be given after the 15th of the month for the filing of the reports, but later on the 15th will be adhered to.

Toledo, Ohio—August is the month chosen for the annual picnic of Toledo coal dealers. It has been determined once more to hold the affair at Sugar Island in conjunction with the Detroit dealers as was done last season. A meeting was held in this city recently at which time it was decided to hold the joint picnic. Committees have been appointed to secure prizes and arrange for the athletic sports and general entertainment which is a feature of this affair.

Mahoney City, Penn.—Crossing the street after having called on a neighbor at Trenton, Penn., recently, Mrs. Andrew Matruck, accompanied by an infant, was engulfed in a mine cave 30 to 40 ft. deep when the roadway suddenly caved in beneath her. With rare presence of mind the woman tossed her child to safety, but received serious injuries herself. The cave-in was due to the weakening of the roof of the Park Place mine, over which the entire village of Trenton is built.

Williamson, W. Va.—The month of June, 1915, established the largest month's coal tonnage for the Norfolk & Western R.R. in the history of the road, exceeding the previous record by over 170,000 tons. In September, 1914, 2,509,916 tons were handled, but in June of the present year 2,680,465 tons were hauled. In 1914, the banner year of the road, it handled 25,471,969 tons of coal. The outlook now is that during the last half of 1915 the output will increase from month to month and establish by a large margin a new high record.

Chattanooga, Tenn.—Nine of the Chattanooga Gas & Coal Products Co. by-product coke ovens are now operative at Alton Park. These are being run on their own gas now, after having been heated for nearly a month with gas from the Chattanooga Gas Co.'s plant in the city. Twelve tons of coke a day are being made in each oven and when the plant is in full operation coke will be produced at the rate of 400 tons daily. This is the first plant to use the new Roberts ovens and is to be visited by a large party of iron steel and coal products manufacturers.

Uniontown, Penn.—The sale of 72.08 acres of coal by the receivers of J. V. Thompson has been confirmed by the Fayette County, Penn., courts on petition of the receivers. For the sale of coal in South Union Township to the trustees of the estate of the late W. J. Rainey the receivers of Mr. Thompson will receive \$129,733, or about \$1665 per acre. There is a mortgage against the tract held by the Citizens Title & Trust Co. of Uniontown for \$110,000. The bank will receive all of the purchase money in satisfaction of the mortgage and interest with the exception of \$15,000 cash which will go to the receivers.

Cincinnati, Ohio—The sale of the Marmet Coal Co.'s properties to the New York syndicate formed to organize the Kanawha Splint Coal Co., with a capital stock of \$20,000,000, to take over the Marmet and other properties, has fallen through for the time being, owing to the failure of the purchasers to make the initial payment. The amount settled upon as the purchase price of the Marmet properties was \$1,500,000, and it was agreed that 25 per cent. of this should be paid at once, but this was not done. The property may therefore be offered for sale again, bids to be received up to Sept. 21, but it is believed that the New York concern will by that time be able to complete the deal.

Pittsburgh, Penn.—A bill in equity was filed July 15 in Common Pleas Court by the Harris Pump & Supply Co. against the Meadowlands Coal Co. in which the appointment of a receiver was asked for. James S. Boggs was named by the court as a temporary receiver. The plaintiff has claims amounting to \$1152.28 against the company which it has been unable to meet. It is alleged that the statement of the company on July 1 showed that its liabilities amounted to \$725,760.25, while the assets consist of valuable coal lands and equipment. It is alleged that owing to the depression in business the coal company had been unable to operate its mines to full capacity, with the result that income had been curtailed making it difficult to meet outstanding obligations.

Philadelphia, Penn.—The Custom House in its report for the fiscal year ending June 30, 1915, shows that during the year there was exported 2,133,081 tons of bituminous coal, which is 56,155 tons less than last year. The decrease in tonnage for the year is due to the fact that at the beginning of the war in Europe last August practically all tidewater shipments ceased, including the coaling of vessels with bunker coal. However, within the past two months the export tonnage has been mounting rapidly. This fact is borne out by the June statement of idle cars issued by the American Railway Association, which shows the number of cars standing July 1 as 83,541, compared with 105,779 for the month previous, and of this total decrease of 24,817 idle cars, 22,238 were coal cars.

Philadelphia, Penn.—Shipments of bituminous coal to the countries of South America are on the increase, and it is altogether likely that this business will be a permanent feature of the American trade, even after the war. There is not a doubt of the ability of American coal to compete with fuel from any part of the world. The shipments to Brazil in particular have increased at a rapid rate. Formerly less than 10,000 tons per annum were exported there, but for this month alone almost 20,000 tons have been shipped, five vessels having left within the last few days with 19,000 tons in their holds. The bulk of the coal for Brazil has heretofore been shipped from Southern ports, but an adjustment in the freight rates has brought a large portion of the business to this port.

Denver, Colo.—One month ago, the state public utilities commission put into effect a new schedule of freight tariffs on Colorado railroads with special application to the coal-hauling roads. These rates are considered fair by retailers, shippers and consumers in that they take account of distances hauled while equalizing the opportunities for large and small producers. The Colorado & Southern Ry. now comes forward with a petition for a reopening of the hearings in the matter, making special plea for readjustment of its freight rate on the long haul to Denver from the South Canon coal mine. Decision on this petition has not been made but it is not likely that any concession will be granted for the reason that such an act would become a precedent for the filing of numerous other similar complaints.

St. Louis, Mo.—The St. Louis Coal Club met recently at the American Annex and devoted the entire evening to a discussion of the city scale law. There was an attendance of about 100, with all branches of the trade represented. The sentiment was unanimous that the law is oppressive and accomplishes no good and ought to be wiped out or substantially modified. President Beddoe was authorized to appoint a committee to organize a campaign for the repeal of the law. He named Fred Kleine, W. H. Boehmer and W. H. Riester. A bill will be submitted to the Board of Aldermen in the fall, providing for the repeal of the present law, which requires coal men to pay 3c. for each load of coal that is weighed. The argument against the law is that the weighman's bond does not protect the dealer, who has to pay for the weighman's mistakes. Ten of the largest cities in the country, it is said, are not using city weigh tickets. A great many of the steam users in St. Louis have their own scales and payment is made on their weight, but the dealer has to pay for the city weigh tickets anyway. The law is said to cost the St. Louis dealers about \$30,000 a year.

Frankfort, Ky.—Opposition to a proposed increase in the freight rate on coal from West Virginia points to central Kentucky over the Chesapeake & Ohio and the Louisville & Nashville railroads was brought out at a hearing held here on July 15 by Examiner H. E. Kelly, of the Interstate Commerce Commission. The Louisville & Nashville objects to the rate of \$1.10, ordered by the commission several months ago suspending an advance; alleges that it gets \$1.20 for a shorter haul from the eastern Kentucky coal field along its own lines and represents that participation by it in a rate of 10c. less from the West Virginia field discriminates against its own territory. The Cabin Creek Coal Co., the Carbon Fuel Co. and the Clear Creek Coal Co. of West Virginia, originated the complaint, and the Chesapeake & Ohio, some of the distillers and local dealers in Frankfort were represented, while other central Kentucky towns displayed much interest. The disadvantages resulting from the situation are illustrated by the fact that the state officials were unable to consider bids of the Clear Creek Co. and other West Virginia firms were not considered in letting contracts for certain state institutions because they were unable to guarantee a price, which must be dependent on rate changes. The West Virginia operators claim that the increase would bar them from a good market, while the Louisville & Nashville contends it is necessary to protect the Kentucky fields. The controversy is a phase of that which has been pending for a long time and the case may get to the higher courts before it is settled finally.

Coal Trade Reviews

General Review

Record breaking dullness prevails in anthracite. Indications of a further slowing up in bituminous also. The rapid expansion in export business continues. Middle Western markets well maintained in spite of the unusual heaviness.

The paucity of anthracite orders is evident in all directions. Conservative members of the trade agree that the summer dullness has scarcely ever witnessed such a combination of extremely low prices and light tonnage. Predictions as to the future are more uncertain. In view of the heavy stocks that are accumulating, the selling agencies are less confident of the anticipated rush for coal this fall, although labor difficulties may complicate the situation later. A slowing up in Lake shipping is throwing some additional tonnage back on the producers, but if the fall movement out from the upper ports is of normal proportions the anthracite Lake movement will be about average.

General dullness still characterizes the bituminous situation in spite of occasional isolated reports of an improvement. The release of large tonnages of high grade coals, that have heretofore been held exclusively for export business, is significant evidence of the trend of conditions. A tremendous movement out of Hampton Roads, reaching to such proportions that the railroads are being crowded for a more rapid dispatch, is creating a distinctly optimistic tone at that point, but this business is restricted to only a few companies specializing in that trade and is not of sufficient proportions to affect the general market.

The salient feature of the Eastern bituminous situation is a light demand on contracts and surpluses at all points. Buyers are again showing indifference, and while there is still much conservatism among agencies regarding future business, concessions are offered to induce prompt buying.

With the steel industry in the Pittsburgh district operating at approximately full capacity, and the railroad and industrial demand slightly better, there is a moderately improved tone to the situation. There is obviously more coal going into consumption, while the export demand has proved a potent factor in relieving the pressure to a certain extent, but on the other hand the Lake movement is falling rapidly behind even the extremely low figures of last month, while prices are generally irregular with contracts being negotiated at still further concessions.

Buyers in Ohio feel confident of being able to purchase their requirements in the prompt market. The situation is also very unsettled and disturbed by various labor, legislative and freight rate difficulties. Market conditions are generally unsatisfactory, with the West Virginia companies absorbing most of the business that develops. The extremely light Lake movement is a particularly unfavorable factor in the situation. Heavy rains are delaying the crop movement to the South, but cotton operations are getting slowly underway, and are beginning to absorb some coal.

An unusual quietness prevails throughout the Middle Western markets, but the operators are meeting the situation by rigidly curtailing outputs down to well within the absorptive power of the trade, so that the situation is well in hand. Conditions toward the Northwest are somewhat brighter. The threshing and school demand are absorbing a larger volume of coal as the season advances and the time for price increases approaches.

A Year Ago—Anthracite rounds out the month in better form than anticipated. Eastern bituminous market at the lowest point for a long time. Situations at interior points picking up under the influence of the large crops and the long suspension in Ohio.

BUSINESS OPINIONS

Iron Age—The steel trade continues to gain ground, with enough lag at certain points in the industry to keep the advance from proceeding too rapidly. The feeling crops out here and there that prices on export business apart from war requirements may be put up too fast. The Steel Corporation's

operations are now at about 91% of its ingot capacity, while the Carnegie Steel Company is employing close to 95% of such capacity. At Chicago the larger operations of the principal plants have been due to the transfer of orders that would naturally be rolled at Pittsburgh.

Am. Wool and Cotton Reporter—The Boston wool market is still displaying great firmness, but has possibly been a trifle quieter on account of the prospective opening up of the new fleeces and territory wools, which are rapidly coming in. The West is becoming absolutely cleaned up of the new clip at prevailing prices. At the London sales the best merinos brought 82 cents clean. Australian cable advices are strong. The cotton goods market is in a moderately quiet condition. The total sales have been somewhat larger than a week ago, but the goods were more spot or early delivery than previously.

Boston News Bureau—If any one doubts the genuineness of the current revival in business and trade he has only to examine the news of the day to be confounded. Everything nearly is on the constructive side of affairs from crop reports and railroads' gross and steel earnings to war orders. All doubt as to the breadth of improvement in the steel and iron industry, which was pretty well dispelled by the last tonnage statement of the Steel Corporation, must be removed by the six months' statement of the biggest independent, Republic Iron. The noteworthy fact that this strong showing is based solely on domestic business makes pertinent the idea so frequently expressed by trade authorities that the revival in the country's basic industry is in no sense a "war-order" movement.

Marshall Field & Co.—Current wholesale distribution of dry goods has maintained about the same volume as during the corresponding week a year ago. The attendance of merchants in the market has been large, indicating a lively interest in merchandise for warm weather retailing.

Dun's—Constructive factors accumulate and the international uncertainties, while making for caution, fail to check the growth of confidence in the future. With the basic influences still gaining in strength, the outlook steadily becomes brighter. It is mainly in sentiment that the general situation continues to reflect uniform and substantial betterment, but in actual commercial transactions there is also concrete evidence of improvement.

Bradstreet's—Factors making for expansion multiply. Evidence is provided by such facts as considerable improvement in industrial matters, virtually full movements in finished steel, overtime work in numerous war-order lines, smart activity at shipyards, freer distribution of seasonable goods, bounteous yields of foodstuffs, better collections, growing scarcity of labor, slightly larger sales of steam coal, absence of strain in money matters at the crop-moving season, increased construction of plants to take care of war orders, and some Western agricultural implement makers resuming operations, whereas a while ago it seemed as though work would not be started before September.

Southern Lumberman—Enlarged activity in general industrial lines, is having its effect on the hardwood market in sustaining it through the unusually dull summer period. While trade is not as active as could be desired, it is nevertheless steady. The settlement of the carpenters' strike at Chicago has injected much optimism into the yellow-pine market.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River market sags again and buyers are encouraged to wait. Improvement not expected until September. Off-shore market has much influence on the situation. Surplus stocks in New England. Pennsylvania shippers again seeking orders. Anthracite orders scarce.

Bituminous—There has been another slackening in the Pocahontas and New River market the past week, with coal again more plentiful than orders at the loading ports. Among some of the shippers there have been small recessions in price

in order to induce spot business but as usual with small result. New England buyers who have so far remained out of the market have resumed their stand-off attitude and it looks as if there would be at least one more noticeable sag their way before there is any pronounced improvement. There is just as much conservatism with regard to options for fall deliveries but for August business the prophets have turned out to be rather previous in their predictions of firmer prices.

The off-shore market is rather erratic. Steamers are somewhat easier to get, however, and a satisfactory export business is looked for in September.

That the export trade has slackened is apparent in the case of Georges Creek. Shippers of this grade have been well supplied with foreign orders all the season, most of the time to the exclusion of coastwise calls, but now there is a plentiful supply at tidewater and clearances for New England have almost resumed their former standing.

Where some of the quality grades from Pennsylvania were declining orders a fortnight ago they are again trying to secure spot business. Production has been well up to capacity and the West Virginia coals are still actively in the market at prices considerably lower than \$2.85. While this continues the Pennsylvania grades will necessarily be somewhat hampered in placing any comprehensive volume of coal until conditions improve.

Water Freights show no pronounced change, although rates are hardly as firm. Seekers for tonnage find themselves obliged to pay the full rate, while owners with tonnage on their hands find it hard to place spot boats except at concessions. The approach of the hurricane season is expected to cause some sail tonnage to withdraw temporarily from the off-shore trade. The rate on bituminous in anthracite-carrying barges, Philadelphia to Boston, shows no sign of being reduced, it now being 5c. higher than a year ago.

Anthracite—The scarcity of orders is now plainly felt. Production is being held down, however, pretty closely to current needs and this adjustment will be likely to continue until the fall demand sets in.

Current prices on bituminous at wholesale are about as follows:

	Clearfields	Cambrils Somersets	Georges Creek	Pocahontas New River
Mines*	\$0.85@1.40	\$1.15@1.60	\$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.65@2.75
Boston†				3.55@3.68
Providence				3.45@3.68

* F.o.b. †On cars.

BALTIMORE

Exports hold up well and month will probably show movement of over 200,000 tons. A better inquiry is developing, but coal is still offering very cheap.

Prices remain unsatisfactory despite an increasing call on contracts. Spot coals of all kinds except the very best grades are offering dangerously close to or below the cost of production. Low grade coals of Pennsylvania are commanding about 90 to 95c. to the trade at the mines, while Maryland and West Virginia coals of the less desirable kinds can be had as low as 75c. Slack is in a little better call and fairly strong at about 50c.

In a big equipment order this week, reaching a total value of \$2,500,000, the Baltimore & Ohio R.R. included 2000 steel hopper cars. This road is planning to meet a colossal coal trade that all are looking forward to when business gets down to a more normal basis.

The export coal trade continues excellent. Prospects are now for shipments considerably in excess of 200,000 tons for July. This coal is going to European, African and South American ports. Last week a total of nearly 58,000 tons of cargo coal was loaded and 23,000 tons of bunker coal. Foreign vessels are bunkering more and more in Baltimore, instead of stopping at Newport News, as in the past. That new bunker contracts will be made here seems assured.

NEW YORK

Soft coal operators are following the British strike closely and some are preparing to ship. Many Italians leaving Southern fields. Anthracite trade quiet. Union officials preparing for labor trouble. Individual coals selling off.

Bituminous—The chief topic of interest among the soft coal operators and shippers is the Welsh labor situation. There are a number of dealers who believe that American shippers will have an opportunity to dispose of much of their coal to English buyers. Some local coal men are so strong in this belief that they are already making inquiries regarding bottoms. Many new inquiries for coal for export are being received from France, Italy and Spain.

There is still more than enough coal on hand to supply all needs. Many loaded vessels are tied up with no buyers in sight. Labor is getting scarce in the West Virginia and Fairmont regions it being estimated that at least 5000 Italians have departed from these sections for their native land. With the market in its present condition their absence is not particularly felt. Contracts are enabling many of the mines producing the better grades to work a little better than half time.

Local conditions do not show much change. Demand continues slow. Spot business is practically dead. Prices remain stationary. Quick buyers are able to pick up some good bargains. New York shippers are watching with much interest the labor situation in Bridgeport, fearing that should operations cease it will result in the loss of considerable business to them.

The better grades of Pennsylvania coals were quoted around \$2.60 and Western Maryland at about \$2.35. Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	\$3.30@3.40	\$3.30@3.40	\$3.30@3.40	\$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	.....	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	.....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	.....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	.....		1.35@1.50
Nanty Glo	2.75@2.80	.....		1.20@1.25
Barnesboro	2.65@2.70	.....		1.10@1.15
Somerset County:				
Quemahoning		2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	.....		.90@1.00
Greensburg	2.75@2.80	.....		1.10@1.15
Westmoreland	2.95@3.20	.....		1.15@1.40
West Virginia Fairmont	2.60@2.70	2.60@2.70	.....	.80@.90
Fairmont mine-run	2.50@2.60	2.50@2.60	.....	.70@.80
Steam	2.45@2.50	2.45@2.50	.....	.90@.95
Western Maryland	2.35@2.40	2.35@2.40	.....	.80@.85

Anthracite—While strenuous efforts are being made to sell anthracite coal, the situation continues dull. In addition to the piers being over-stocked the harbor contains many loaded bottoms. The only bright spot is in the small steam sizes. Restriction in mining has affected these coals and there is a note of strength. Large consumers are making inquiries. The better grades are getting scarce, due to the less than half time operations.

The labor situation is also taking some attention from the operators. At the same time the mine owners are being brought face to face with the efforts of the Mine Workers Union to strengthen their organization before the expiration of the working agreement on Mar. 31. Daily meetings are being held throughout the mining regions which are being attended by the international officers of the organization.

Chestnut is long size of the prepared coals. Stove is the most active with egg a good second. Individual prepared coals are being quoted at from 40 to 50c. off the companies' circular. Considerable pea is being stocked. On the buckwheat coals quotations are noted at from \$1.40 for No. 3 to \$3 for No. 1.

Current quotations follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	\$4.85		\$4.90	
Egg	5.10	\$4.70@5.10	5.15	\$4.75@5.15
Stove	5.10	4.70@5.10	5.15	4.75@5.15
Chestnut	5.35	5.00@5.35	5.40	5.05@5.40
Pea	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.00
Buckwheat	2.50@2.75	2.00@2.25	2.55@2.80	2.05@2.30
Rice	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Anthracite continues very dull, with prices well off circular. Only strength lies in egg and stove, with chestnut difficult to move, and pea sold at extremely low prices. Bituminous shows no improvement locally, but tide shipments continue to hold up.

Anthracite—All agencies agree that they are not doing half the business now that they did the same time last year. One of the oldest men connected with the trade states his company has never before witnessed such conditions—extremely low prices coupled with the extraordinarily light tonnage. However, all dealers report they are receiving good orders for fall delivery.

Chestnut continues the worst size; with the storage yards filled and no market it is becoming quite a serious proposition and individual operators are taking any price. April circular for this size is common and it is known that some business has been taken at 10c. less. Egg and stove sizes are probably in better demand than the other grades, and some of the shippers claim they have good business on these sizes for shipment to the New England market. There was a report here, however, that egg was being offered in 500-ton lots at \$3.10.

Pea coal continues on its erratic career. Big buyers of this size who only a few months ago gladly paid \$2.25 plus the tax will not consider \$2 flat now. One large dealer reports that he is buying plentifully of this size at less than \$1.50, and if such is the case it is more than likely it is coal that has been protected as to price by a producer to cover fuel intended for the schools, the contract for which was recently awarded at an extremely low figure. There is no doubt that there is plenty of pea to be had at \$1.50, as one colliery owner is offering this size direct at that figure.

A sales agent of one of the largest companies has instructed his force to devote the next two weeks to collecting accounts, though this is even more difficult than selling coal at this time; in fact some shippers are emphasizing their offer of long time credits. This is being featured with desirable business more than ever and even those dealers who have had the reputation of being notoriously slow pay are finding no difficulty in stocking up.

It is now becoming difficult to predict what the market will be since the unprecedented stagnation this summer will likely leave its effect. It hardly seems probable that the large storage tonnage can be absorbed even in the face of a possible strike. On the other hand there may be a stringency of coal to meet the orders when the cold weather comes, due to the fact that the steel mills in this vicinity are offering wages that are attracting labor to such an extent that when fall demand opens up it is likely to be serious.

The circular prices, to which the state tax of 2½% must be added, are as follows:

	City	Tide		City	Tide
Broken	\$3.20	\$4.45	Pea	\$2.50	\$3.25
Egg	3.45	4.70	Buckwheat	1.25	2.25
Stove	3.70	4.70	Rice	.85	1.75
Chestnut	3.85	4.95	Barley	.50	1.50

BITUMINOUS—The trade is extremely inactive and does not seem to have recovered from the slowing down over the Fourth of July. The working time at the mines has been very much reduced accordingly. Export business is a specialty with certain companies, and whether times are brisk or dull the other concerns rarely touch it. Those companies particularly interested in the export business continue to report a good volume of trade, especially to South American countries, and Brazil in particular lately. One difficulty has been lately to secure carriers, which has of course made the rates high. With the exception of tide shipments the trade does not look for any marked improvement for a month or six weeks, and in the meantime prices continue very low, but with no likelihood that any further reductions will be made.

The ruling prices are about as follows:

Georges Creek Big Vein	\$1.65@1.75	Fairmont gas, mine-run	\$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.65@.75
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@.95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@.80
West Va. Freeport	.85@.95	Fairmont slack	.45@.55

HAMPTON ROADS

Large shipments both foreign and coastwise. Prices firm. Indications bright for heavy movement during balance of month.

The dumpings over all piers during the week have been very heavy especially as regards export movement. Italy still receives the bulk of the export shipments although some fair sized cargoes have gone to South America ports. The demand is heavy for New River and Focahontas run-of-mine. Some shipments of nut and slack have also been made but the demand for these as well as the high volatiles is not heavy.

English mine conditions have not as yet, so far as can be seen, caused any additional inquiries and unless the strike continues for some time it is not believed that prices at Hampton Roads will be affected.

There is little free coal at Hampton Roads at this time as practically all shippers are rushed with orders and are dumping the coal into vessels as fast as it arrives from the mines. The railroads are rushing coal forward with all possible speed and are doing everything possible to get vessels loaded as promptly as possible. There have been times during the past week when some of the larger shippers had vessels in port for over 50,000 tons of cargo with less than one-fourth of the coal on hand.

With the amount of coal already dumped and the vessel tonnage declared, the expectations are that the total tonnage for the month of July will be a million and a half or over.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending				
	June 19	June 26	July 3	July 10	July 17
Norfolk & Western	207,824	213,279	211,017	174,822	180,090
Chesapeake & Ohio	71,511	79,870	83,678	76,397	116,862
Virginian	51,644	87,840	58,455	57,467	78,710
Totals	330,979	380,989	291,828	308,686	375,662

COAL AGE

OCEAN FREIGHTS

Rates to various destinations are quotable as follows:

To	Rate	To	Rate
Havana	\$2.00@2.25	Bermuda	\$3.00
Cardenes or Sagua	2.75@3.00	Vera Cruz	3.50@3.75
Cienfuegos	2.75@3.25	Tampico	3.50@3.75
Port au Spain, Trinidad	3.50@3.75	Rio	8.40
St. Lucia	3.50@3.75	Santos*	8.40@8.64
St. Thomas	3.00@3.25	Montevideo	8.22
Barbados	3.50@3.75	Buenos Aires or La Plata	8.28
Kingston	2.75@3.00	Rosario	8.64
Curacao	3.25@3.50	West Coast of Italy	8.64@8.88
Santiago	2.50@3.00	Barcelona**	8.16
Guantanamo	2.50@3.00	Valparaiso or Callao	6.25@6.50
Demerara	4.25@4.50	Marseilles	8.40

Note—Rates noted in bold face type are only approximate.

*Consignees paying dockage dues. **Spanish dues for account.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	Nationality	To	Tons	Rate
Glenmount	Br.	Antilla	1246	
Laura Holdt		Paramaribo	425	\$4.25
Emily F. Northam		Yarmouth, N. S.	315	1.90
Derwenthall	Br.	Marseilles	2514	
Haniborne	Dutch	Santiago	742	
Aldernay	Nor.	Havana	1970	
Tyskland	Dan.	Antilla	876	
Northmount	Br.	Sweden	1172	
Kiruna	Swd.	Mediterranean	2386	
Balmoral	Ital.	Mediterranean	2325	
Italian bark	Ital.	Mediterranean	2027	
Australia	Ital.	Mediterranean	1442	
Ortrud	Ital.	Mediterranean	1402	
Pacific	Am.	Havana	3394	
Verdun	Br.	Rio Janeiro	2950	8.28
Torridon	Ital.	Savona		

BALTIMORE

Henrik ¹	Nor.	Peru ²	2453	6.75
Kingsgate	Br.	Buenos Ayres	2370	8.28
St. Theodore	Br.	Genoa	3175	
Ubbagen	Dutch	Port Limon	1150	
Bendew	Br.	Barcelona ³	2305	
Cleanthis	Greek	Italy		
Falk	Nor.	Santa Marta		
Andrea Costa	Ital.	Leghorn		
Andriana	Greek	Campagna		8.40
Andriana	Greek	Rosario		8.64
Bonair	Br.	Spain		
Linda Hall	Br.	Egypt		
Andyk	Hol.	Netherlands		
Socrakarta	Hol.	Egypt		
Matelot	Ital.	Italy		
Heima	Nor.	Cuba		
Mantaro	Per.	Peru		
Polvarth ¹	Br.	Villa Constitucion ⁴	1972	8.64
King Idwal ¹	Br.	Montevideo	2306	8.16
Cloutsham	Br.	Buenos Ayres ⁵	3075	8.28
Wieringen	Dutch	Buenos Ayres ⁵	1948	8.37
Panaghi Vagliano	Greek	Rosario	1878	8.37
Stylians Bebis	Greek	Mediterranean	2216	8.40
Lady Plymouth	Br.	Italy	2246	9.60

¹ Or Virginia. ² Chile. ³ Or Valencia. ⁴ Or Campana. ⁵ Or La Plata.

VIRGINIA (Including Hampton Roads)

Henrik ¹	Nor.	Peru ²	2453	6.75
Oratios Couppas	Greek	Marseilles	1846	8.46
Merak	Dutch	Rosario ³	1877	8.64
Dionyssios Stathatos ¹	Greek	Barcelona	2296	8.64
Polvarth ¹	Br.	Villa Constitucion ⁴	1972	8.64
King Idwal ¹	Br.	Montevideo	2306	8.16

¹ Or Baltimore.

² Chile.

³ Three trips.

⁴ Or Campana.

⁵ Or La Plata.

ATLANTIC RANGE

Andriana	Greek	Villa Constitucion ¹	1867	8.40
.....	Am.	Pacific Coast	5500 ²	5.25

¹ Or Campana. ² Guarantee (no vessel named yet). ³ To 8000 Tons.

Note—Steamers are indicated by bold face type, all others being schooners

VESSEL CLEARANCES

The following vessels have cleared from Norfolk and New- port News, July 9 to 16, inclusive:

Norfolk	Vessel	Destination	Tons	Norfolk	Vessel	Destination	Tons
Paddington ¹	Naples	3,759	Fairport	Genoa	6400		
Kintail ²	Las Palmas	5,457	Swindon	Messina	6910		
Proclide ¹	Genoa	5,480	Polvarth	Buenos Aires	4282		
Stella ³	Callao	3,500	Josey	Havana	5000		
Tottenham ²	St. Lucia	4,600	Merak	Rosario	4400		
Hauwen	Montevideo	5,403	Tasmania	Leghorn	4700		
Mar Terse	Siracusa	4,830	Ada F. Brown	Rio de Janeiro	2116		
Denis ⁴	Para	2,750		Newport News (Not complete)			
Ulysses	Canal Zone	12,000		Francesco			
				Ciampa			
				Mariteres			
Christoforos ¹	Naples	5,800	Toronto				
Purificazione ¹	Porto Ferrajo	4,303	Morocco				
Westerdijk	Spesia	8,700					
Dinnamare	Naples	4,600	Pocahontas Fuel Co.				
Il Piemonte	Spesia	6,726	Castner, Curran & Bullitt				
Mars	Buenos Aires	4,701	Smokeless Fuel Co.				
			Chesa. & Ohio C. & C. Co.				

LAKE MARKETS

PITTSBURGH

Better manufacturing demand but poorer Lake shipments, leaving mining operations at about 50%. Increased export demand expected for Connellsville. A new byproduct plant.

The industries are taking somewhat more coal, almost wholly by way of heavier specifications on contracts. The steel industry is now operating almost at its capacity, and coal consumption in that quarter is about as great as can be expected. Railroad requirements show a slight improvement. Lake shipments are decidedly less than in June, though it is not unusual for July to show some decrease. Altogether the Pittsburgh district is experiencing scarcely any better demand for coal than in the past two months, and mine operations only average about 50% of capacity. An increased demand for export coal is expected should the Welsh mines be tied up for long but this will affect the Connellsville region chiefly and will hardly reach the Pittsburgh district.

Pickands, Mather & Co., Cleveland, have joined with the United Steel Co., Canton, Ohio, to put up a blast furnace and byproduct coking plant at the latter point, and Pickands, Mather & Co. will probably furnish the coal for the plant through some of their various connections. Prices for free coal are as irregular as ever. The general basis remains quotable about as follows: Slack, 45@50c.; nut and slack, 90@95c.; nut, 95c.@\$1; mine-run, \$1@1.05; 3/4-in., \$1.10@1.15; 1 1/4-in., \$1.20@1.25, per net ton at mine, Pittsburgh district. Even contracts to Apr. 1 could be made at substantially these figures, except of course in the case of slack.

BUFFALO

The improvement in iron creates a better feeling. Volume of bituminous larger. Anthracite still moving slow.

Bituminous—While there are some who still report no improvement they are now in the minority. There is more coal going into consumption and the export demand is growing at a good rate. This market does not profit directly by ocean shipments, but they lessen competition. All reports from the iron trade are good. Ore coming down the Lakes is in large volume and it is going out from the lower docks even faster than it is received.

If the Canadian trade would pick up a little there would be a most hopeful outlook, but it does not look as if there would be much in that trade right away. Should the war stop before long, there ought to be a general upturn of all sorts of business, both here and in Canada. Buffalo sells so much coal across the border that the dropping off there is a serious matter.

Bituminous prices are stronger except slack, which has received a hard blow from the refusal of operators to stock any this summer. It often goes at a very low price, though the best salesmen refuse to accept it. Quotations remain on the basis of \$2.70 for best Pittsburgh lump, \$2.55 for three-quarter, \$2.45 for mine-run and \$2.15 for slack, with sizes much stronger than slack.

Anthracite—The demand is so light that the trade is practically at a standstill, as compared with the average summer. However there is never anything like a large warm weather trade in this section, unless there is some sort of a scare on, such as was the case last August, when it was thought the Canadian trade might be shut off. It is believed now that the demand will be all the better late in the season on account of the general slowness now.

Shipments by Lake have fallen off but this is not expected to last. There are reports that stocks are getting too large at the upper port, but the shippers as a rule say that they have room enough yet and with a fair amount of fall buying the big Lake movement of anthracite can be kept up all the summer and fall. There is only a small local trade. Shipments by lake for the week were 105,600 tons.

CINCINNATI

Sluggishness continues in all departments, with virtually no market. However, short stocks will probably force purchasers into the market soon.

Retail dealers everywhere seem to be entirely confident of their ability to secure coal at low prices, and they are still justified in that belief by the continued sacrifices which are being made. Prices which necessarily mean a loss to the mine have been common lately, although a number of high-class concerns are holding firmly for profitable figures. Smokeless seems to be in its usual strong position, reinforced, as always, by the relatively limited supply. Splint and gas are in extremely poor demand, with no definite prospects.

CLEVELAND

Coal receipts too small to fill the demand for the first time in months. Lack of orders for prepared sizes is the cause. Coarse coal remains unchanged and the Lake trade is very light.

When the week opened only 175 cars of new coal were on track. This is about half as much as has been coming in over Sunday the last few weeks and a third of a normal Monday morning stock. Fine coal was up five cents and went to contract customers almost entirely. Large consumers called upon their dealers for more fine coal and received sufficient to take care of their immediate needs, but could furnish nothing beyond that.

So light are the three-quarter Lake shipments that fine coal is limited; this will result in hand-fired boilers using mine-run or three-quarter. There is no improvement in sight for the Lake trade and consequently there will be no increase in slack. The supply of slack has been decreasing for about two weeks and is not likely to be larger for two weeks more. Jobbers are predicting \$1.75 to \$1.80 for this grade by Aug. 1.

Pocahontas and other smokeless fuel operators in the southern field are refusing orders for lump and egg at current prices. They will accept all the orders they can get for mine-run at the circular or a shade under, but will not name a figure on lump and egg to anyone except old customers.

Retail dealers are not taking much coal and are not expecting to until nearer fall. It is likely there will be about six weeks of a rush in the Ohio and western Pennsylvania fields this fall. The Upper Lake docks will move coal to interior points in large quantities during the grain season, Oct. 1 to Dec. 1, and the retail demand will be large about the same time. This is the only bright spot in the future now.

Quotations for shipment are:

	Pocahon- tas	Youghio- gheny	Bergholz	Fair- mont	Ohio No. 8
Lump.....	\$3.45				
Lump, 3 in.....		\$2.15	\$1.90	\$1.85@1.90	\$1.85@1.90
Egg.....	3.45				
Mine run.....	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack.....		1.60	1.50	1.55	1.50

TOLEDO

Prices stronger and movement a little better. Lake movement fair. Operators holding back production.

A better tone is noted in the local market. Prices are stronger and there is a little more buying. The threshing season is now at its height with a big crop to harvest and this has helped out the situation to some extent. The Lake movement is strengthened somewhat and it is expected that dealers will soon begin their regular fall stocking. Steam coal is quiet and improvement is anticipated shortly.

West Virginia coal still seems to have the inside track, especially in the Lake business. Kentucky coal has also experienced a fair movement at good prices. Hocking, Pomeroy and practically all the Ohio grades are slow and not very firm as to price, but there is a marked tendency on the part of operators to shut off the production rather than make large concessions. Smokeless demand continues fairly firm but there is practically none of the better grades being offered; there has been no change in prices but they are beginning to hold closer to the list.

COLUMBUS

Dealers buying more freely but the situation continues dull. Lake trade has amounted to scarcely anything and West Virginia producers are even aggressively competing for local business.

Dealers are beginning to give more earnest attention to next season's stocks, and there is a fair run of orders for July and August delivery. Few shippers are giving any guarantee in prices beyond Sept. 1. It is believed that dealers' stocks will be found short of normal when fall sets in, by reason of tardy buying during the summer, and that this will cause a material advance over present quotations.

The general state of the trade is bad. A number of operators have taken the position that the mining rate is prohibitive under prevailing industrial conditions, and will allow mines to remain idle until prospects brighten. Operators are slower than for many seasons past, except when strikes have existed. Ohio markets are being largely taken over by aggressive West Virginia competition, which has the benefit of a much lower mining rate.

Lake trade from the Hocking Valley will be practically nil this season. The largest producing company, which for several years past has averaged over 1,000,000 tons to the Northwest docks, has not shipped a single cargo, and nearly all of its mines are down. The Pomeroy district has shipped about 35,000 tons to the Lakes so far this season, which is about half of the tonnage for which it holds orders.

There is little indication of any marked revival in the steam trade. Mine-run and screenings remain at the low prices which have prevailed for some time. Consumers are depending largely on the open market. A generally hopeful view is taken of fall and winter.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Kanawha
Rescreened lump...	\$1.50	\$1.55	
Inch and a quarter...	1.35	1.35	\$1.30
Three-quarter 'nch...	1.25	1.30	1.25
Nut...	1.15	1.25	1.15
Mine run...	1.10	1.10	1.05
Nut, pea and slack...	.70	.75	.65
Coarse slack...	.60	.70	.55

Mines have been working at about the following percentages of full capacity.

District	Week Ended				District	Week Ended			
	June 26	July 3	July 10	July 17		June 26	July 3	July 10	July 17
Hocking...	25	25	20	25	Cambridge...	30	20	25	35
Jackson...	20	25	15	25	Masillon...	30	15	25	30
Pomeroy...	45	30	45	40	Eastern O...	50	40	60	50
Crooksville...	25	55	30	20	Average...	32	30	31	32

LOUISVILLE, KY.

Beginning of cotton movement and improvement in general conditions creating a better tone.

The domestic stocking demand is slow appearing, especially in the interior. The almost constant rains are delaying threshing and perhaps damaging the grain. Cotton gins and cotton seed mills are soon to start in the South and a demand is beginning to develop in that section. Some steel plants are calling for Kentucky coal, but generally industrial conditions are still backward.

Prices quoted range all the way from \$1.25 to \$1.90 on block, and from 25 to 40 and 40 to 60c. on nut and slack, although as a matter of fact operators are selling, to a considerable extent, for what they can get. Nut and slack in the western Kentucky field is more plentiful than for a long time.

COKE

CONNELLSVILLE

Much stronger feeling, due to improvement in iron and steel markets. Appraisement of J. V. Thompson's properties. Holiday decreases production and shipments.

There has occurred a very decided stiffening in the views of coke operators as to the price furnace coke should bring, and while no sales at advanced prices have been made the whole tone of the market is clearly stronger, being helped by the further and more marked improvement in the steel industry and by the greater activity in pig iron, which has led to slightly higher prices in Bessemer and basic grades, though not in foundry iron. There are two or three inquiries out for furnace coke for delivery over various periods. The market seems to stand about as follows: Prompt furnace, \$1.60; July and third quarter, \$1.75; second half, \$2; prompt foundry, \$2@2.50; contract foundry, \$2.20@2.50, per net ton at ovens.

The appraisement of the properties of Josiah V. Thompson, Uniontown, who went into receivers' hands last January, has been filed in court, showing a total value of \$65,367,758. Included in the coal holdings are 58,404 acres in Greene County.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended July 10 at 340,742 tons, a decrease of 30,672 tons, and shipments at 330,073 tons, a decrease of 46,884 tons. The decreases were due to celebration of the national holiday.

Buffalo—There is much report of a stir in coke, consequent on the better state of the iron trade and this is expected to last. Some of the dealers report that they have sold a few cars at a slight advance. The larger concerns, though, generally refuse to acknowledge the advance, but say that it will come if the better demand continues. Iron ore by Lake follows the increase in the coke movement and the entire feeling is much better than it has been in a long time. Quotations are strong on the basis of \$4.15 for best 72-hr. Connellsville foundry, with stock coke \$3.20.

Chicago—Domestic sizes of byproduct coke are flat, and it is easy to obtain a concession of 15c. per ton from circular prices on immediate sales. Furnace and foundry sizes seem to be stronger, and the wholesalers predict higher prices shortly. Prices are as follows: Byproduct, \$4.65@5.10; Connellsville, \$4.75@5; Wise County, \$4.75; gas coke, \$3.75@4.90, furnace, \$4.75.

MIDDLE WESTERN

GENERAL REVIEW

General outlook encouraging with demand quiet but prices held reasonably firm. Screenings steady. Anthracite moving slowly.

The market has been unusually quiet during the past week, and the rush of orders at the close of June seems to have been followed by calm. Shippers appear to have anticipated this situation, and production is being closely held down to the market requirements. A slight increase in domestic buying has been noticed at the higher prices.

There is little consignment coal on track in Chicago and prices on all sizes have been well maintained; in fact the market is showing such strength that as soon as there is a normal demand it will likely result in another advance in prices. Domestic consumers still show no anxiety to stock up. Retail dealers bought a small additional tonnage at the lower prices prevailing at the close of last month, they have not since made efforts to increase their commitments. The downward trend of screenings seems to have been checked, and prices on fine coal are steady.

CHICAGO

Demand generally quiet except on screenings. West Virginia grades in generally good demand. No consignment coal noted. Anthracite moving slowly but a strong demand anticipated later.

The demand for domestic sizes from southern Illinois mines has been quiet, but shipments show a fair increase as compared with the previous month. Lump and No. 1 nut have been in demand, but No. 2 nut has been heavy even at concessions. Threshing coal from Saline County has been moving briskly.

Springfield screenings have been active during the past week, the minimum price being 70c. Domestic sizes are still very slow.

Indiana contract customers are beginning to take a little more coal, so that the operators have a more hopeful outlook. Domestic lump shipments have been increased from Sullivan County mines, but they have not been so active from the Clinton district. Screenings from Clinton mines have been moving in a steady volume, while from Sullivan County they have been dragging. One or two Knox County mines are now sold up fully on contract, and are not in the open market.

Pennsylvania smokeless mine-run, lump and nut shipments are quiet, while the demand for egg has been steady. Prices on all grades of Pennsylvania smokeless in this market have strengthened over last week.

Hocking shipments have been steady at about the same ratio as last week, and country buying is quite apparent. Prices are well held and no consignment coal is on the market.

Eastern Kentucky coals are still quoted at various prices, with the buyer still in control. Slack coal has been sacrificed on demurrage. Some shipments direct from the mines have sold as high as \$2 and Millers Creek block and nut have been active at fair prices, with little demand for egg.

Anthracite chestnut is moving slowly, and the demand for all other sizes is very quiet. Some shippers into this territory are trying to force business by cutting prices, but without much success. It is felt that a full tonnage at circular prices is bound to be moving not later than the month of August.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump...	\$1.35@1.50	\$1.25@1.35	\$1.35@1.50	\$1.25@1.35	\$1.40@1.50
Steam lump	1.15@1.25	1.10@1.25	1.15@1.25	1.15@1.25	1.15@1.25
1 1/2-in. lump...	1.25@1.35	1.25@1.35	1.20@1.30	1.30@1.35	1.30@1.35
1 1/4-in. lump...	1.15@1.25	1.15@1.25	1.15@1.25	1.15@1.25	1.15@1.25
Egg...	1.35@1.50	1.25@1.35	1.10@1.25	1.05@1.15	1.15@1.25
Nut...	1.25@1.50	1.15@1.25	1.00@1.10	.90@1.05	1.00@1.05
No. 1 washed...	1.35@1.50	1.40@1.50	1.35@1.40	1.35@1.40	1.35@1.40
No. 2 washed...	1.25@1.35	1.40@1.50	1.35@1.40	1.35@1.40	1.35@1.40
No. 1 nut...	1.35@1.50	1.40@1.50	1.35@1.40	1.35@1.40	1.35@1.40
No. 2 nut...	1.25@1.35	1.40@1.50	1.35@1.40	1.35@1.40	1.35@1.40
Mine-run...	1.05@1.15	1.00@1.10	.85@1.00	.90@1.00	.85@1.00
Screenings...	.65@.80	.70@.75	.65@.75	.60@.75	.65@.75
Harrisburg & Saline Co. E. Kentucky W. Va. Smok'l. Smokeless Hocking					
Lump...	\$1.25@1.50	\$1.35@2.00	\$1.90@2.00	\$1.45@1.90	\$1.35@1.60
1 1/2-in. lump...	1.10@1.25	1.25@1.40	1.25@1.40	1.25@1.35	1.25@1.35
Egg...	1.25@1.35	1.25@1.75	1.75@1.90	1.35@1.75	1.10@1.25
Nut...	1.15@1.45	1.45@1.65	1.25@1.35	1.00@1.10	1.00@1.10
No. 1 nut...	1.25@1.50	1.45@1.65	1.35@1.50	1.35@1.50	1.35@1.50
No. 2 nut...	1.25@1.35	1.45@1.65	1.35@1.50	1.35@1.50	1.35@1.50
Mine-run...	1.00@1.10	.95@1.25	1.10@1.25	1.00@1.15	.95@1.00
Screenings...	.70@.75	.60@.80	....	....	....

Receipts by Lake—Arrivals by Lake for the week to July 19 and for the month and season to date were as follows:

Chicago			South Chicago		
Vessel	From	Tons	Vessel	From	Tons
J. S. Keele	Oswego	2,262	Frank Billings	Toledo	8,800
S. N. Parent	Oswego	2,212	Price McKinney	Buffalo	8,100
Francis Widlar	Erie	7,000			
A. D. Davidson	Oswego	2,250			8,100
Venus	Buffalo	5,131			8,800
R. W. England	Erie	5,615			
		24,470	Note—Tonnages noted in full face type are bituminous, all others being anthracite.		
Totals for July and the Season			Total July	91,511	83,219
From	1915	1914	Total season	27,705	40,671
Buffalo	13,231	21,028		349,757	254,472
Buffalo		2,600		191,275	297,087
Oswego	6,724	4,622			
Erie	12,615	6,662			
Toledo	8,800	8,500			
Ashtabula		7,200			
Sandusky		11,000			
	32,570	39,512			
	8,800	22,100			

INDIANAPOLIS

Usual midsummer dullness. Some reports of weakening in slack market. Better call for domestic lump from schools and farms. Prices generally unchanged.

About normal summer conditions prevail in the Indiana coal industry. Operators are looking forward to the long-expected improvement in the industrial demand. There is said to be signs of weakening in the screening market, but 85 to 90c. is still obtainable for best No. 4 and 75 to 80c. for others. Mine-run sells at \$1.15@1.20 for No. 4 and \$1.05 for Nos. 5 and 6.

There is better call for domestic lump, as country schools are now laying in supplies and the demand for threshing is now of some volume. The best prepared lump sells for \$1.50 f.o.b. mines; standard grade at \$1.40; egg, \$1.35. The movement from retail yards to consumers' bins gets gradually larger, as the time draws nearer when there may be an advance in price. The following schedule prevails at the Indianapolis yards:

	Per Ton	Per Ton	
Linton No. 4 forked	\$3.00	Pocahontas forked lump	\$5.50
Indiana lump, forked	2.75	Pocahontas shoveled lump	5.00
Indiana lump and egg, screened	2.50	Pocahontas mine run	4.00
Kanawha lump, forked	4.25	Pocahontas nut and slack	3.50
Ohio Hocking lump, forked	4.25	Anthracite chestnut	7.75
Ohio Hocking, washed egg	4.50	Anthracite stove and egg	7.50
Kentucky lump	4.50	Anthracite grate	7.25
Ohio Jackson lump, forked	5.00	Connellsburg coke	6.00
Blossburg smithing	5.50	Indianapolis by-product coke (all sizes)	5.50
Cannel lump	6.00		

ST. LOUIS

Prices steadier but movement still light. Screenings softer.

There has been a bracing-up of prices on the finer grades of lump and nut during the past week, but there has not been much movement except to the Northwest, where the thresher demand is still helping out; there has also been some shipping in that direction for stocking. A surplus of Carterville screenings has forced the prices down on all grades of this size and they have been weak at 75 to 80c. while some are said to have been offered at 70.

The quotations at the end of the week were:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	\$1.35@1.50	\$1.25	\$1.35	\$0.95
2-in. lump		.95	1.25	.85
3-in. lump			1.25	
3x6 egg	1.35@1.50			.80
No. 1 nut	1.35@1.50			
No. 2 nut	1.15@1.25			
No. 1 washed	1.40		1.50	
No. 2 washed	1.25			
No. 3 washed	1.15			
No. 4 washed	1.10			
No. 5 washed	.80			
Screenings	.75@ .80	.70		.70

PRODUCTION AND TRANSPORTATION STATISTICS

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R. R. Co.'s lines east of Pittsburgh and Erie for June of the current year and the six months of 1914 and 1915, in short tons:

	June		Six Months	
	1915	1914	1915	1914
Anthracite	843,053	855,247	5,423,467	5,654,277
Bituminous	3,664,703	3,897,544	20,261,777	23,555,182
Coke	990,476	793,463	4,998,919	5,227,885
Total	5,498,232	5,546,254	30,684,163	34,437,344

EXPORTS

The June coal exports by districts and states were as follows:

	Anthracite	Bituminous	Coke
Maine and New Hampshire	1,217		
Maryland	298	232,866	396
Massachusetts	1		
New York	18,081	3,044	628
Philadelphia	9,614	107,645	3,591
Virginia		445,917	5,361
Florida	45		
Mobile		433	
New Orleans		2,530	39
Arizona		1,124	82
El Paso		18,968	18,671
Laredo		2,202	
Hawaii		10	
Southern California	2	26	
San Francisco			11
Washington	70	144	3,659
Buffalo	147,883	152,479	35,137
Dakota	645	1,772	157
Duluth and Superior	58	1,031	122
Michigan		32,430	5,168
Ohio	20,800	344,505	450
Rochester	104,649	40,634	78
St. Lawrence	117,334	16,171	973
Vermont	1,977	346	55
Total	422,694	1,404,277	74,581

Bunker Coal

Customs Districts	April	May	June
New York	267,104	266,826	273,142
Philadelphia	32,948	34,600	41,531
Maryland (Baltimore)	35,265	60,783	56,986
Virginia	120,357	172,012	146,291

FOREIGN MARKETS

GREAT BRITAIN

July 9—Welsh steam coals show general quietness without material alteration in the position. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	... \$6.00@6.24
Best seconds	Nominal	Seconds	5.76@6.00
Seconds	\$6.24@6.48	Best Cardiff smalls	4.68@4.80
Best dry coals	6.00@6.24	Cargo smalls	3.75@3.96

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is on moderate lines with the tendency firm for the Upper Mediterranean. Rates are approximately as follows:

	June	Six Months
To	1913	1914
Russia	701,764	705,715
Sweden	354,149	391,533
Norway	157,619	152,058
Denmark	199,486	219,991
Germany	772,053	823,975
Netherlands	147,737	163,574
Belgium	135,467	140,565
France	1,062,395	965,326
Portugal ¹	126,652	102,929
Spain ²	290,000	253,377
Italy	777,463	632,393
Aus. Hung.	33,732	83,892
Greece	54,749	66,664
Romania	20,507	25,514
Turkey	14,118	60,116
Algeria	92,552	75,139
Portuguese ³	15,590	9,258
Chile	70,954	34,035
Brazil	170,564	135,821
Uruguay	60,911	66,334
Argentina	297,715	210,369
Channel Is.	8,672	10,036
Gibraltar	19,406	14,526
Malta	35,300	35,129
Egypt ⁴	209,995	211,818
Aden ⁵	12,639	5,708
India	14,582	12,800
Ceylon	29,153	26,096
Miscell'ous	120,486	99,526
Coke	75,336	73,163
Briquettes	185,162	192,034

Total	6,266,908	5,999,417	3,725,423	37,048,137	36,148,907	23,377,177
Bunker	1,721,016	1,681,477	1,065,779	10,087,037	10,182,157	7,400,321
¹ Includes Azores and Madeira. ² Including Anglo-Egyptian Sudan. ³ And dependencies. ⁴ And Canaries. ⁵ West Africa.						

Note—The figures in the above table do not include Admiralty and certain other shipments.

Coal Contracts Pending

COAL AGE

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 12.

+ Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 728—New York, N. Y.—Bids on this contract (Vol. 8, p. 76) calling for 2350 gross tons of egg or stove coals for fireboats, divided into three items, were opened on July 19, as follows: Item 1—1150 tons for fireboats in North River, at foot of Bloomfield St. and West 35th St.; John F. Schmadeke, \$5.95 per ton, total, \$6842.50; William Farrell & Son, \$5.93 per ton, total, \$6819.50. Item 2—600 tons for fireboat and launch berthed at the Battery. John F. Schmadeke, \$5.95, total, \$3570; William Farrell & Son, \$5.93, total, \$3558; Bacon Coal Co., \$5.86, total, \$3510. Item 3—600 tons for fireboats berthed at the foot of 38th St., Brooklyn, and St. George, Staten Island. Commercial Coal Co., \$6.18 per ton, total, \$3708. Address Fire Commissioner Robert Adamson, Municipal Building, New York City.

No. 922—New Orleans, La.—Bids on this contract (Vol. 7, p. 1127), which provides for furnishing the local School Board with approximately 2000 tons of anthracite and bituminous coal, will be received until July 26. Address Secy. E. A. Williams, Bd. of Edu., 4th floor, Municipal Bldg., New Orleans, La.

1019—Allentown, Penn.—Bids on this contract (p. 77), which provides for furnishing the Whitehall Township school district with chestnut and stove coal, were as follows: Balliet Bros. & Co., \$6.25; R. E. Grammer, \$6.25. The board has as yet taken no action on the matter, as additional bids are anticipated shortly. Address Secy. A. N. Kuhns, Orefield, Penn.

1054—Ottumwa, Iowa—Bids on this contract (p. 116), which provides for furnishing local School Board with approximately 1600 tons of screened lump coal, will be received until 6 p.m., Aug. 9. Bids are to include cost of delivery in the coal cellars. Address Secy. J. A. Wagner, Bd. of Edu., Ottumwa, Iowa.

New Business

1096—Kansas City, Mo.—Montgomery Ward & Co. will let a contract for the year's supply of coal for the Kansas City branch about Aug. 1. It uses about 6000 tons of Cherokee mill. Address Purchasing Agent, Montgomery Ward & Co., Kansas City, Mo.

1097—Norwalk, Conn.—The Board of Education at this place will contract some time in August for about 100 tons of anthracite and bituminous coal. The call for bids is advertised. Address Board of Education, Norwalk, Conn.

1098—Huntingdon, Penn.—The Board of Education at this place will receive bids until Aug. 1 for furnishing 250 tons of the best Broad Top coal, bids to include cost of delivery in the cellars of the school buildings as designated. All the coal is to be delivered during the month of August. Address Secy. H. H. Waite, Bd. of Edu., Huntingdon, Penn.

1099—Jefferson City, Mo.—The State Commissioners will receive sealed bids until 10 a.m., July 26, for furnishing the coal supply to the various state departments for the fiscal year beginning Oct. 1. Address Secy. Cornelius Rouch, Com. of Permanent Seat of Government, Jefferson City, Mo.

+1100—Columbia, Mo.—Sealed proposals for furnishing approximately 14,000 tons of coal during the year commencing Sept. 1, 1915, will be received by the Curators of the University

of Missouri until noon, July 28. Address Bus. Mgr. Edward E. Brown, University of Missouri, Columbia, Mo.

+1101—Urbana, Ohio—The County Commissioners will receive sealed bids until noon, July 26, for furnishing 100 tons of anthracite and 50 tons of Jackson No. 2 or Virginia splint coal. Bids should include cost of delivery in the coal bins at the Court House in carload lots as ordered. Address County Audr. O. E. Eby, Bd. of Comrs., Urbana, Ohio.

+1102—Beaver Falls, Penn.—The School Directors of North Sewickley Township will receive bids until 1:30 p.m., July 31, for furnishing the coal requirements at the nine school buildings of the district during the ensuing year. Address Secy. S. O. Swick, Beaver Falls, Penn.

+1103—Wahjamega, Mich.—Sealed bids will be received until 10 a.m., Aug. 6, for furnishing the Michigan Farm Colony for Epileptics with approximately 80 tons of coal per month during the ensuing year; also about 100 tons of anthracite, stove and egg will be required. Address Steward C. W. Gage, Farm Colony, Wahjamega, Mich.

+1104—Springdale, W. Va.—The local school board will receive bids until 6 p.m., Aug. 3, for furnishing 4000 bu. of mine-run coal to be delivered into the basement of the local school house. Address Secy. W. A. Clowes, Jr., Springdale Borough School Board, Springdale, Penn.

+1105—Pierre, S. D.—The Board of Education at this place will receive sealed bids until 8 p.m., July 30, for furnishing 350 tons of Youghiogheny and Pocahontas mine-run coal; 275 tons are to be delivered on or before Sept. 1 and the balance as directed during the month of January. Address Clk. Tom C. McNamee, Bd. of Edu., Pierre, S. D.

+1106—Pennsburg, Penn.—The Board of Education will receive sealed bids until 6 p.m., July 24, for furnishing and delivering stove coal to the various school buildings during the ensuing year. Bids will also be received separately for both furnishing and delivering the coal. Address Harvey C. Jones, Bd. of Edu., Pennsburg, Penn.

1107—Kansas City, Mo.—The Densmore Hotel will let it contract for about 300 tons of slack during the month of August. Address Purchasing Agent, Densmore Hotel, 912 Locust St., Kansas City, Mo.

+1108—Sharpsville, Penn.—The School Board at this place will receive bids until 7 p.m., July 30, for furnishing from 150 to 200 tons of coal to be delivered at the school building. The best grade of three-quarter screened Pittsburgh coal is required. Address Secy. H. B. Wert, School Bd., Sharpsville, Penn.

+1109—Grenada, Miss.—The local Water and Light Department usually contracts in August for their annual fuel requirements involving about 3000 tons of nut and slack coal. The customary price is \$2.50 per ton. Address Supt. S. L. Alward, Light & Water Dept., Grenada, Miss.

+1110—New Bethlehem, Penn.—The School Board at this place will receive bids until July 31 for furnishing mine-run coal to the local schools during the coming season. Address Secy. C. E. Sheffer, New Bethlehem, Penn.

+1111—St. Joseph, Mo.—The Board of Education usually contracts some time in August for their fuel requirements which aggregate about 4000 tons. Standard bituminous lump coal is ordinarily used and the current contract is being filled at \$3.17 per ton. The business is let on competitive bids, and a bond for \$2500 guaranteeing the satisfactory performance of the contract is required. The business is not advertised, specifications being mailed to all dealers. Address Supply Committee, Board of Education, St. Joseph, Mo.

+1112—Natrona, Penn.—The Harrison Township School Board received sealed bids until July 19 for furnishing coal required at the local schools during the term beginning Aug. 30. Address Secy. Percy M. Kennedy, 76 Vine St., Natrona, Penn.

+1113—Shippensburg, Penn.—The Local School Board is requesting sealed bids for furnishing 100 gross tons of bituminous coal, deliveries to be completed by the last of August. All bids must be in by July 26. Address Secy. C. E. Warren, Shippensburg School Dist., Shippensburg, Penn.

+1114—Hazlehurst, Miss.—The City Water & Light Plant at this place usually contracts some time in August for their annual requirements of coal which amount to about 90 tons of No. 2 lump per month. The business is done on competitive bids, and the usual price is about \$1.02 per ton f.o.b. mine. Address Supt. M. L. Slay, City Water & Light Plant, Hazlehurst, Miss.

+1115—Roscoe, Penn.—The local School Board at this place received sealed bids until July 20 for furnishing 1800 bu. of coal to be delivered at the school buildings. Address Secy. John Lee, Roscoe School Bd., Roscoe, Penn.

+1116—Windsor, Mo.—The Board of Education at this place is inviting bids from coal operators until Aug. 5 for furnishing the winter supply of fuel. Address Secy. J. W. McIntire, Bd. of Edu., Windsor, Mo.

+1117—Rockville, Ind.—The local School Board will receive bids until July 24 for furnishing approximately 5000 tons of coal. Address Secy. O. M. Teague, Bd. of Edu., Rockville, Ind.

+1118—Connellsville, Penn.—Sealed bids will be received until 2 p.m., July 31, for furnishing the various schools of Perry Township with coal during the ensuing year. Address Secy. J. R. Martin, Bd. of Edu., Perry Township, Connellsville, Penn.

+1119—Lansing, Mich.—The Industrial School at this place will receive bids until noon, July 29, for furnishing approximately 3000 tons of coal to be delivered in the coal sheds as may be required. Bids are requested on three-quarter steam lump, mine-run and screened coal, and bidders must name the state where the coal is mined. Address Supt. E. M. Lawson, The Industrial School, Lansing, Mich.

+1120—New Orleans, La.—The Board of Education will receive sealed bids until noon, July 26, for furnishing the public schools with coal as required during the coming school year. Specifications may be obtained on application. Address Secy. E. A. Williams, Bd. of Edu., Municipal Bldg., Carondelet and Lafayette St., New Orleans, La.

+1121—Springfield, Ill.—The Illinois State Board of Administration received bids until July 15 for furnishing the various State charitable institutions with approximately 173,400 tons of coal. Illinois coal will be used exclusively with the exception of about 5000 tons of Pocahontas. The coal is to be delivered at 18 plants in 15 different cities and towns. The requirements are as follows: Lump, 1000 tons; mine-run, 42,000 tons; 2-in. screenings, 12,000 tons; 1 1/4-in. screenings, 114,000 tons; slack, 4000 tons; rescreened nut, 460 tons; Pocahontas mine-run, 500 tons. Payment will be made on a heat basis. Address The Illinois State Board of Administration, Springfield, Ill.

+1122—West New York, N. J.—The Board of Education at this place will receive bids until 8 p.m., July 26, for furnishing 400 tons of pea coal and 200 tons of nut. Address Board of Education, West New York, N. J.

+1123—Indianapolis, Ind.—The Board of Trustees for the Indiana State School of Deaf will receive sealed bids until 10 a.m., Aug. 15, for furnishing approximately 4000 tons of 1 1/4-in. standard screenings or washed coal, and about 40 tons of nut. The latter tonnage is to be delivered by wagon, and on the former, quotations should be f.o.b. switch at the powerhouse door. A certified check for \$500 must be filed with all proposals. Address Secy. Richard O. Johnson, Bd. of Trustees, Indiana State School of Deaf, 42nd St. and Monon R.R., Indianapolis, Ind.

+1124—Ipswich, Mass.—The Board of Education at this place will receive bids until Aug. 2 for furnishing 100 tons of anthracite furnace coal and 200 tons of bituminous. Address Superintendent Ipswich School Board, Room 9, Town Hall, Ipswich, Mass.

+1125—Columbus, Ohio—The Director of Public Safety will receive sealed bids until noon, July 29, for furnishing and delivering 1250 tons of the best quality lump coal to the city prison, workhouse, and various engine houses as may be required. All bids must be accompanied by a bond in the sum of \$318.70. Address Dir. of Pub. Safety, B. L. Bargar, City Hall, Columbus, Ohio.

+1126—Hattiesburg, Miss.—The School Board at this place received sealed bids until July 23, for furnishing approximately 200 tons of high-grade coal. Address Supt. F. B. Woodley, 417 Walnut St., Hattiesburg, Miss.

+1127—Indianapolis, Ind.—The School Board at this place will receive sealed proposals until 8 p.m., July 27, for furnishing its fuel requirements during the year ending July 31, 1916. All bids must be made according to specifications and on blanks, which can be obtained on application. A deposit of \$500, guaranteeing the satisfactory performance of the con-

tract, will be required. Address Business Dir. John F. Cleland, Bd. of Edu., Indianapolis, Ind.

+1128—North Bergen, N. J.—The Board of Education at this place will receive bids until 8 p.m., July 28, for furnishing the local schools with approximately 600 tons of nut coal during the ensuing year. Address Board of Education, North Bergen, N. J.

+1129—West Norfolk, Va.—The Virginia Smelting Co. at this place is in the market for 2000 to 2500 tons of anthracite buckwheat No. 3. Shipments are to begin Oct. 1 and deliveries to be made in 1000-ton cargoes. Address Purchasing Agent, The Virginia Smelting Co., West Norfolk, Va.

+1130—Bremen, Ohio—The School Board at this place will receive sealed bids until 7 p.m., July 24, for furnishing and delivering 200 bu. of screened lump coal to the schools in Rushcreek Township. Two hundred bushels will be required in each district. Deliveries are to be completed by Sept. 1. Address Clk. J. W. McCullough, Bd. of Edu., Bremen, Ohio.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+No. 616—San Francisco, Calif.—This contract (Vol. 7, p. 795), which provides for furnishing the lighthouse inspector at this place with coal, has been awarded to the **Western Fuel Co.** at \$10.55 per ton for Wellington coal in sacks and \$7.35 per ton in bulk. Address Lighthouse Inspector H. W. Rhodes, 18th Lighthouse District, San Francisco, Calif.

No. 745—Houston, Tex.—This contract (Vol. 7, p. 917), which provides for furnishing the local Board of Education with coal, was awarded to **Rice & Coles** at \$4.50 per ton for Peerless screened lump coal. Richard Cocks & Co. bid \$4.64 for Illinois coal, and Sampson & Bearden \$4.50 for the same grade. Address W. Peirce, Public School Board, Houston, Tex.

No. 795—Cullman, Ala.—This contract (Vol. 7, p. 1005), which provides for furnishing the local Light and Water Plant with approximately 2400 tons of washed nut coal, has been awarded to the **Blocton-Cahaba Coal Co.** at \$1.50 per ton. Address Supt. B. Kiel, Light and Water Plant, Cullman, Ala.

+No. 855—Wilmington, N. C.—This contract (Vol. 7, p. 1085, Vol. 8, p. 76), which provides for furnishing the U. S. Engineers at this place with 13,000 tons of bituminous coal, has been awarded to the **Logan Coal & Supply Co.**, Jacksonville, Fla., the gross consideration being \$17,680. Address Maj. H. W. Stickle, Corps of Engrs., U. S. Engineers' Office, Wilmington, N. C.

No. 856—Kansas City, Mo.—This contract (Vol. 7, p. 1085, Vol. 8, p. 40), which provides for furnishing the local Board of Education with approximately 7000 tons of coal, has been awarded to the **Sweeney Coal Co.** on semianthracite lump at 20 1/2c. per bu., and the **J. T. Wellington Co.** on deep shaft Cherokee lump at 14 1/2c. per bu. Address Pur. Agt. F. S. Casey, Bd. of Edu., Kansas City, Mo.

+No. 904—Uniontown, Penn.—This contract (Vol. 7, p. 1087), which provides for furnishing the local Board of Education with its coal and coke requirements, has been awarded to **John A. Whyel & Son**, at \$7 per ton for mine-run coal and \$3 per ton for soft coke. E. C. Rich bid \$6.90 per ton for mine-run and \$3.50 per ton for soft coke. Address C. L. Davidson, Schools District of Uniontown Borough, Uniontown, Penn.

No. 911—Cherokee, Iowa—This contract (Vol. 7, p. 1126), which provides for furnishing the local Board of Education with approximately 300 tons of coal, has been awarded to **Schoenmier Bros Co.**, on La Salle lump coal at \$4.50 per ton. Address Secy. William Shardlow, Independent School District of Cherokee, Cherokee, Iowa.

+No. 921—Rensselaer, Ind.—This contract (Vol. 7, p. 1127), which provides for furnishing Jasper County with approximately 400 tons of coal, has been awarded to the **Power Coal Co.**, of Chicago. Address Audr. J. P. Hammond, County Comr. Rensselaer, Ind.

No. 922—Rock Island, Ill.—This contract (p. 76), which provides for furnishing the Standard Oil-Cloth Co. with two cars of screenings per month has again been renewed. No details are available. Address Standard Oil-Cloth Co., Rock Island, Ill.

+No. 928—Quincy, Ill.—This contract (Vol. 7, p. 1127), which provides for furnishing the local Water Department, its annual requirements of coal, has been let to the **Wabash Coal Co.** at \$3 per ton for 3-in. screened lump coal. The cost is to include whatever expense the dealer may be put to in weighing the coal on the city scales. This price compares with \$2.84 per ton of 4-in. screened lump coal on the contract for the past year. Address, Business Mgr., Clyde L. Sears, Bd. of Edu., Quincy, Ill.